

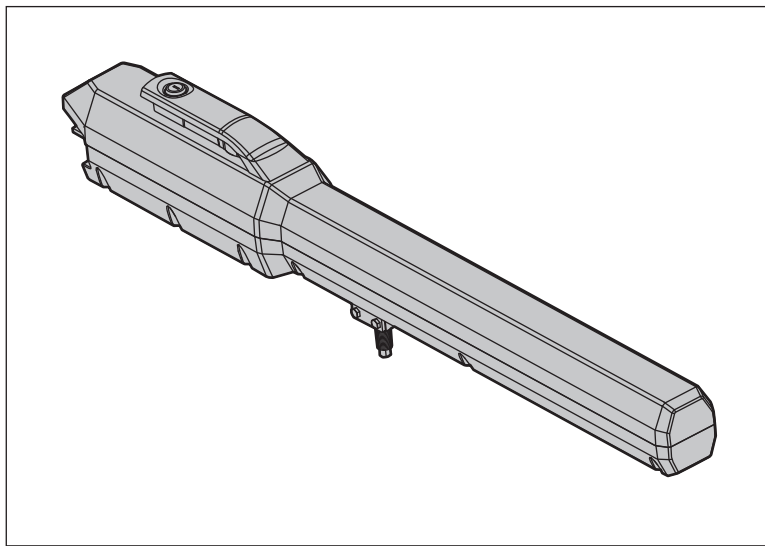
# LiftMaster®

ELITE SERIES®

## LA500 & LA500-S

### VEHICULAR SWING GATE OPERATOR

#### INSTALLATION MANUAL



*Your model may look different than the model illustrated in this manual.*

**THIS PRODUCT IS TO BE  
INSTALLED AND SERVICED BY  
A TRAINED GATE SYSTEMS  
TECHNICIAN ONLY.**

Visit [www.liftmaster.com](http://www.liftmaster.com) to  
locate a professional installing  
dealer in your area.

This model is for use on vehicular  
passage gates **ONLY** and not  
intended for use on pedestrian  
passage gates.

This model is intended for use in  
Class I, II, III and IV vehicular swing  
gate applications.

**UL325**  
compliant



**UL991**  
compliant



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## SAFETY

When you see these Safety Symbols and Signal Words on the following pages, they will alert you to the possibility of serious injury or death if you do not comply with the warnings that accompany them. The hazard may come from something mechanical or from electric shock. Read the warnings carefully.

When you see this Signal Word on the following pages, it will alert you to the possibility of damage to your gate and/or the gate operator if you do not comply with the cautionary statements that accompany it. Read them carefully.

### IMPORTANT NOTE

- *BEFORE attempting to install, operate or maintain the operator, you must read and fully understand this manual and follow all safety instructions.*
- *DO NOT attempt repair or service of your gate operator unless you are an Authorized Service Technician.*

### SAFETY SYMBOL AND SIGNAL WORD REVIEW

 **WARNING**

MECHANICAL

 **WARNING**

ELECTRICAL

**CAUTION**

### UL325 MODEL CLASSIFICATIONS

#### CLASS I – RESIDENTIAL VEHICULAR GATE OPERATOR

A vehicular gate operator (or system) intended for use in a home of one-to four single family dwellings, or a garage or parking area associated therewith.

#### CLASS II – COMMERCIAL/GENERAL ACCESS VEHICULAR GATE OPERATOR

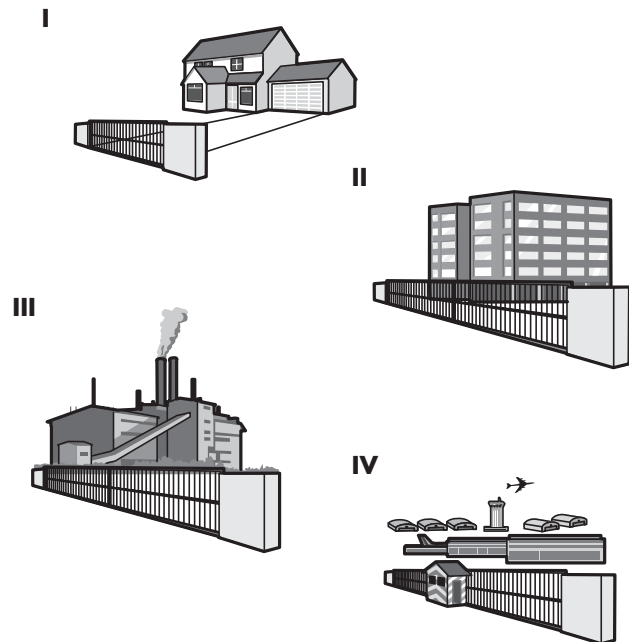
A vehicular gate operator (or system) intended for use in a commercial location or building such as a multi-family housing unit (five or more single family units) hotel, garage, retail store or other building servicing the general public.

#### CLASS III – INDUSTRIAL/LIMITED ACCESS VEHICULAR GATE OPERATOR

A vehicular gate operator (or system) intended for use in a industrial location or building such as a factory or loading dock area or other location not intended to service the general public.

#### CLASS IV– RESTRICTED ACCESS VEHICULAR GATE OPERATOR

A vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.



### UL325 ENTRAPMENT PROTECTION REQUIREMENTS

This chart illustrates the entrapment protection requirements for the UL325 classes.

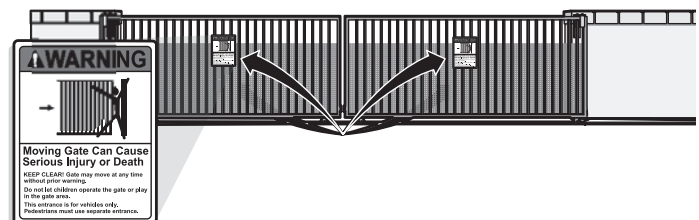
GATE OPERATOR ENTRAPMENT PROTECTION		
UL325 Classification	Swing Gate Operator	
	Primary Type	Secondary Type
CLASS I-CLASS IV	A	B1 or B2

In order to complete a proper installation you must satisfy the entrapment protection chart shown. That means that the installation must have one primary means of entrapment protection and one independent secondary means of entrapment protection. Both primary and secondary entrapment protection methods must be designed, arranged or configured to protect against entrapments in both the open and close directions of gate travel.

For Example: For a gate system that is installed on a single-family residence (UL325 Class I) you must provide the following: As your primary type of entrapment protection you must provide

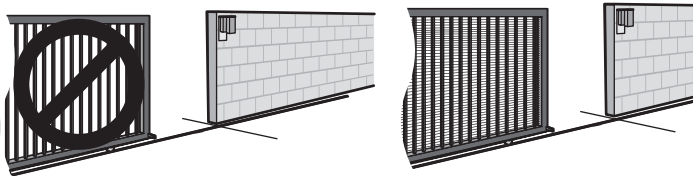
- Type A - Inherent (built into the operator) entrapment sensing and at least one of the following as your secondary entrapment protection:
- Type B1 - Non-contact sensors such as photoelectric sensors,
- Type B2 - Contact sensors such as gate edges

**NOTE:** UL requires that all installations must have warning signs placed in plain view on both sides of the gate to warn pedestrians of the dangers of motorized gate systems.



### SAFETY INSTALLATION INFORMATION

1. Vehicular gate systems provide convenience and security. Gate systems are comprised of many component parts. The gate operator is only one component. Each gate system is specifically designed for an individual application.
2. Gate operating system designers, installers and users must take into account the possible hazards associated with each individual application. Improperly designed, installed or maintained systems can create risks for the user as well as the bystander. Gate systems design and installation must reduce public exposure to potential hazards.
3. A gate operator can create high levels of force in its function as a component part of a gate system. Therefore, safety features must be incorporated into every design. Specific safety features include:
  - Gate Edges
  - Photoelectric Sensors
  - Vertical Posts
  - Guards for Exposed Rollers
  - Screen Mesh
  - Instructional and Precautionary Signage
4. Install the gate operator only when:
  - a. The operator is appropriate for the construction and the usage class of the gate.
  - b. All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 4 feet (1.2 m) above the ground to prevent a 2-1/4 inches (6 cm) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position.



- c. All exposed pinch points are eliminated or guarded, and guarding is supplied for exposed rollers.
5. The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.

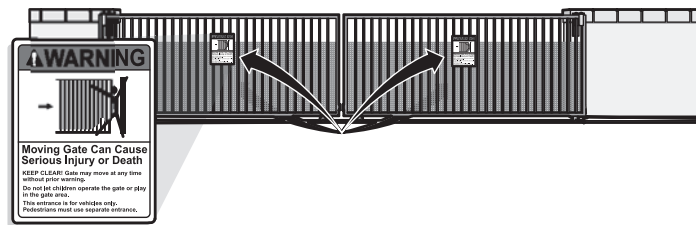


6. The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates shall not open into public access areas.
7. The gate must be properly installed and work freely in both directions prior to the installation of the gate operator.

8. Controls intended for user activation must be located at least 6 feet (1.8 m) away from any moving part of the gate and where the user is prevented from reaching over, under, around or through the gate to operate the controls. Outdoor or easily accessible controls shall have a security feature to prevent unauthorized use.



9. The Stop and/or Reset (if provided separately) must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.
10. A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.



11. For a gate operator utilizing a non-contact sensor:
  - a. Reference owner's manual regarding placement of non-contact sensor for each type of application.
  - b. Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
  - c. One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.
12. For a gate operator utilizing a contact sensor such as an edge sensor:
  - a. One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as at the leading edge, trailing edge and post mounted both inside and outside of a vehicular horizontal slide gate.
  - b. One or more contact sensors shall be located at the bottom edge of a vehicular vertical lift gate.
  - c. A hard wired contact sensor shall be located and its wiring arranged so the communication between the sensor and the gate operator is not subject to mechanical damage.
  - d. A wireless contact sensor such as the one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.
  - e. One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 6 inches (152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.
  - f. One or more contact sensors shall be located at the bottom edge of a vertical barrier (arm).

## GATE CONSTRUCTION INFORMATION

Vehicular gates should be installed in accordance with ASTM F2200: Standard Specification for Automated Vehicular Gate Construction. For a copy, contact ASTM directly at 610-832-9585 or [www.astm.org](http://www.astm.org).

### 1. GENERAL REQUIREMENTS

- 1.1 Gates shall be constructed in accordance with the provisions given for the appropriate gate type listed, refer to ASTM F2200 for additional gate types.
- 1.2 Gates shall be designed, constructed and installed to not fall over more than 45 degrees from the vertical plane, when a gate is detached from the supporting hardware.
- 1.3 Gates shall have smooth bottom edges, with vertical bottom edged protrusions not exceeding 0.50 inches (12.7 mm) when other than the exceptions listed in ASTM F2200.
- 1.4 The minimum height for barbed tape shall not be less than 8 feet (2.44 m) above grade and for barbed wire shall not be less than 6 feet (1.83 m) above grade.
- 1.5 An existing gate latch shall be disabled when a manually operated gate is retrofitted with a powered gate operator.
- 1.6 A gate latch shall not be installed on an automatically operated gate.
- 1.7 Protrusions shall not be permitted on any gate, refer to ASTM F2200 for Exceptions.
- 1.8 Gates shall be designed, constructed and installed such that their movement shall not be initiated by gravity when an automatic operator is disconnected.
- 1.9 A pedestrian gate shall not be incorporated into a vehicular gate panel or that portion of the adjacent fence that the gate covers in the open position.

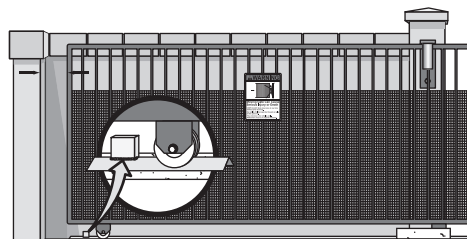
### 2. SPECIFIC APPLICATIONS

- 2.1 Any non-automated gate that is to be automated shall be upgraded to conform to the provisions of this specification.
- 2.2 This specification shall not apply to gates generally used for pedestrian access and to vehicular gates not to be automated.
- 2.3 Any existing automated gate, when the operator requires replacement, shall be upgraded to conform to the provisions of this specification in effect at that time.

### 3. VEHICULAR HORIZONTAL SLIDE GATES

- 3.1 The following provisions shall apply to Class I, Class II and Class III vehicular horizontal slide gates:
  - 3.1.1 All weight bearing exposed rollers 8 feet (2.44 m), or less, above grade shall be guarded or covered.
  - 3.1.2 All openings located between 48 inches (1.22 m) and 72 inches (1.83 m) above grade shall be designed, guarded or screened to prevent a 4 inch (102 mm) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that covers in the open position.

- 3.1.3 A gap, measured in the horizontal plane parallel to the roadway, between a fixed stationary object nearest the roadway, (such as a gate support post) and the gate frame when the gate is in either the fully open position or the fully closed position, shall not exceed 2 1/4 inches (57 mm), refer to ASTM F2200 for Exception.
- 3.1.4 Positive stops shall be required to limit travel to the designed fully open and fully closed positions. These stops shall be installed at either the top of the gate, or at the bottom of the gate where such stops shall horizontally or vertically project no more than is required to perform their intended function.
- 3.1.5 All gates shall be designed with sufficient lateral stability to assure that the gate will enter a receiver guide, refer to ASTM F2200 for panel types.
- 3.2 The following provisions shall apply to Class IV vehicular horizontal slide gates:
  - 3.2.1 All weight bearing exposed rollers 8 feet (2.44 m), or less, above grade shall be guarded or covered.
  - 3.2.2 Positive stops shall be required to limit travel to the designed fully open and fully closed positions. These stops shall be installed at either the top of the gate, or at the bottom of the gate where such stops shall horizontally or vertically project no more than is required to perform their intended function.



### 4. VEHICULAR HORIZONTAL SWING GATES

- 4.1 The following provisions shall apply to Class I, Class II and Class III vehicular horizontal swing gates:
  - 4.1.1 Gates shall be designed, constructed and installed so as not to create an entrapment area between the gate and the supporting structure or other fixed object when the gate moves toward the fully open position, subject to the provisions in the 4.1.1.1 and 4.1.1.2.
    - 4.1.1.1 The width of an object (such as a wall, pillar or column) covered by a swing gate when in the open position shall not exceed 4 inches (102 mm), measured from the center line of the pivot point of the gate, refer to ASTM F2200 for exception.
    - 4.1.1.2 Except for the zone specified in Section 4.1.1.1, the distance between a fixed object such as a wall, pillar or column, and a swing gate when in the open position shall not be less than 16 inches (406 mm), refer to ASTM F2200 for exception.
  - 4.2 Class IV vehicular horizontal swing gates shall be designed, constructed and installed in accordance with security related parameters specific to the application in question.

### REQUIRED ENTRAPMENT PROTECTION DEVICES

#### ⚠ WARNING

To prevent **SERIOUS INJURY** or **DEATH** from a moving gate:

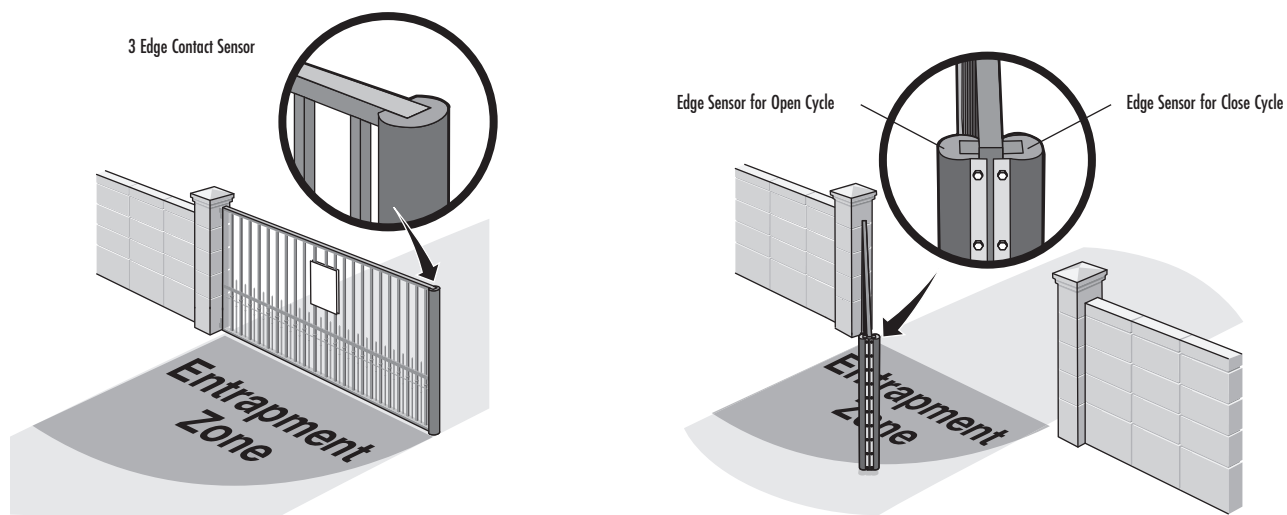
- Entrapment protection devices **MUST** be installed to protect anyone who may come near a moving gate.
- Locate entrapment protection devices to protect in **BOTH** the open and close gate cycles.
- Locate entrapment protection devices to protect between moving gate and **RIGID** objects, such as posts or walls.

An entrapment zone is every location or point of contact where a person can become entrapped between a moving gate and a stationary object. All gate operator systems **REQUIRE** two independent entrapment protection systems for each entrapment zone. This operator contains an inherent (internal) entrapment protection system (the primary entrapment protection system) and **REQUIRES** the addition of an external entrapment protection system (non-contact photoelectric sensor or contact safety edge sensor) for **EACH** entrapment zone.

Your application may contain one or many entrapment zones. Property owners are obligated to test entrapment protection devices monthly.

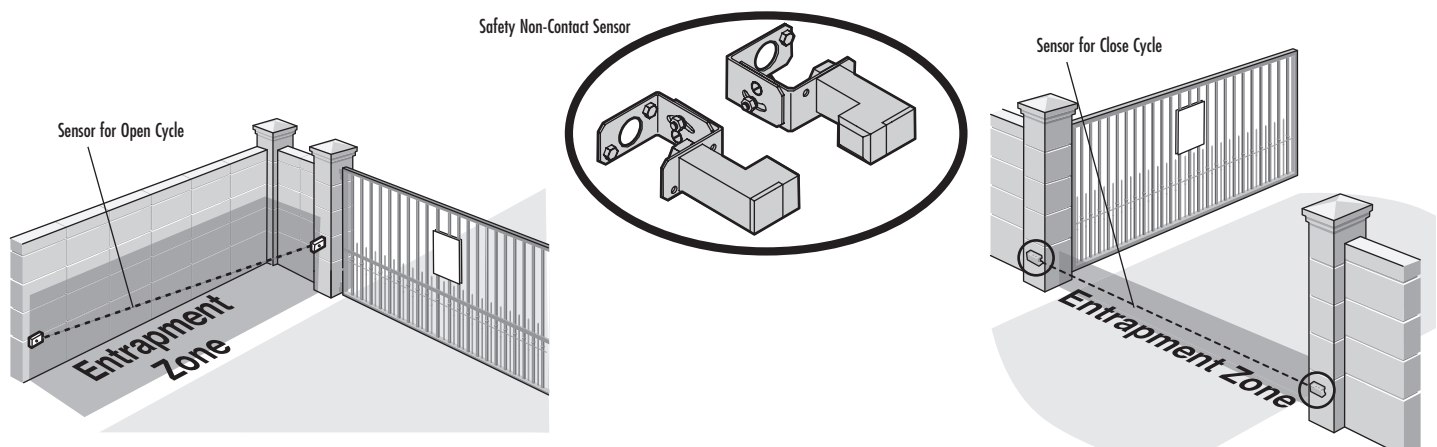
#### CONTACT SENSORS (EDGE SENSORS)

If the electrically activated edge sensor comes in contact with an obstruction while the gate is moving, the gate will stop and reverse. The gate will not be able to travel in that direction until the obstruction is cleared. Use non monitored edge sensor models G65MG0204, G65MGR020, or G65MGS020.



#### NON-CONTACT SENSORS

If the photoelectric sensor beam gets blocked while the gate is moving, the gate will stop and reverse. The gate will not be able to travel in that direction until the obstruction is cleared. It is best to use monitored photoelectric sensors, model CPS-UN4. If a monitored photoelectric sensor is not working or loses power or the beam is blocked, then **ALL** gate operation in that direction will stop. Unmonitored photoelectric sensor models AOMRON and RETROAB are also acceptable.





### IMPORTANT SAFETY INFORMATION

#### INSTALLATION

#### WARNING

To prevent **SERIOUS INJURY** or **DEATH** from a moving gate:

- Pinch points must be guarded at all times. Install enclosed-style gate tracks and roller guards.
- Place screen mesh 4 feet (1.2 m) high on the gate to prevent access through openings anywhere the gate may travel.
- Mount controls at least 6 feet (1.8 m) from the gate or ANY moving part of the gate.
- Install Warning signs on EACH side of gate in PLAIN VIEW. Permanently secure each Warning sign in a suitable manner using fastening holes.
- This operator is intended for vehicular use only. To prevent **INJURY** to pedestrians, a separate pedestrian access should be supplied, visible from the gate. Locate the pedestrian access where there is not a chance of **INJURY** at any point during full movement of the gate.
- Contact sensors **MUST** be located at the leading and trailing edges, and post mounted both inside and outside a horizontal swing gate. Non-contact sensors such as photo eyes **MUST** be mounted across the gate opening and operate during BOTH the open and close cycles.
- Entrapment protection devices **MUST** be installed to protect anyone who may come near a moving gate.
- Locate entrapment protection devices to protect in BOTH the open and close gate cycles.
- Locate entrapment protection devices to protect between moving gate and RIGID objects, such as posts or walls.
- Too much force on gate will interfere with proper operation of safety reversal system.
- NEVER increase force beyond minimum amount required to move gate.
- NEVER use force adjustments to compensate for a binding or sticking gate.
- If one control (force or travel limits) is adjusted, the other control may also need adjustment.
- After ANY adjustments are made, the safety reversal system **MUST** be tested. Gate **MUST** reverse on contact with a rigid object.
- DO NOT touch the heater when switch is on, heater may be hot.

#### CAUTION

- To AVOID damaging gas, power or other underground utility lines, contact underground utility locating companies BEFORE digging more than 18 inches (46 cm) deep.
- ALWAYS wear protective gloves and eye protection when changing the battery or working around the battery compartment.

#### WIRING

#### WARNING

To reduce the risk of **SEVERE INJURY** or **DEATH**:

- ANY maintenance to the operator or in the area near the operator **MUST NOT** be performed until disconnecting the electrical power (AC or solar and battery) and locking-out the power via the operator power switch. Upon completion of maintenance the area **MUST** be cleared and secured, at that time the unit may be returned to service.
- Disconnect power at the fuse box BEFORE proceeding. Operator **MUST** be properly grounded and connected in accordance with national and local electrical codes. **NOTE:** The operator should be on a separate fused line of adequate capacity.
- ALL electrical connections **MUST** be made by a qualified individual.
- DO NOT install ANY wiring or attempt to run the operator without consulting the wiring diagram. We recommend that you install an edge sensor BEFORE proceeding with the control station installation.
- ALL power wiring should be on a dedicated circuit and well protected. The location of the power disconnect should be visible and clearly labeled.
- ALL power and control wiring **MUST** be run in separate conduit.

#### ADJUSTMENT

#### WARNING

To reduce the risk of **SEVERE INJURY** or **DEATH**:

- Without a properly installed safety reversal system, persons (particularly small children) could be **SERIOUSLY INJURED** or **KILLED** by a moving gate.
- Too much force on gate will interfere with proper operation of safety reversal system.
- NEVER increase force beyond minimum amount required to move gate.
- NEVER use force adjustments to compensate for a binding or sticking gate.
- If one control (force or travel limits) is adjusted, the other control may also need adjustment.
- After ANY adjustments are made, the safety reversal system **MUST** be tested. Gate **MUST** reverse on contact with a rigid object.



### IMPORTANT SAFETY INFORMATION CONTINUED...

#### ADDITIONAL FEATURES

#### WARNING

To prevent SERIOUS INJURY or DEATH from a moving gate:

- Entrapment protection devices **MUST** be installed to protect anyone who may come near a moving gate.
- Locate entrapment protection devices to protect in **BOTH** the open and close gate cycles.
- Locate entrapment protection devices to protect between moving gate and **RIGID** objects, such as posts or walls.

#### MAINTENANCE AND OPERATION

#### WARNING

To reduce the risk of SEVERE INJURY or DEATH:

- **READ AND FOLLOW ALL INSTRUCTIONS.**
- **ANY** maintenance to the operator or in the area near the operator **MUST NOT** be performed until disconnecting the electrical power (AC or solar and battery) and locking-out the power via the operator power switch. Upon completion of maintenance the area **MUST** be cleared and secured, at that time the unit may be returned to service.
- Disconnect power at the fuse box **BEFORE** proceeding. Operator **MUST** be properly grounded and connected in accordance with national and local electrical codes. **NOTE:** *The operator should be on a separate fused line of adequate capacity.*
- **NEVER** let children operate or play with gate controls. Keep the remote control away from children.
- **ALWAYS** keep people and objects away from the gate. **NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.**
- The entrance is for vehicles **ONLY**. Pedestrians **MUST** use separate entrance.
- Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or reverse when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of **INJURY** or **DEATH**.
- Use the manual disconnect release **ONLY** when the gate is not moving.
- **KEEP GATES PROPERLY MAINTAINED.** Read the owner's manual. Have a qualified service person make repairs to gate hardware.
- **ALL** maintenance **MUST** be performed by a LiftMaster professional.
- Activate gate **ONLY** when it can be seen clearly, is properly adjusted and there are no obstructions to gate travel.
- To reduce the risk of **FIRE** or **INJURY** to persons use **ONLY** LiftMaster part 29-NP712 for replacement batteries.
- **SAVE THESE INSTRUCTIONS.**

#### CAUTION

- **ALWAYS** wear protective gloves and eye protection when changing the battery or working around the battery compartment.

#### TROUBLESHOOTING

#### WARNING

To protect against fire and electrocution:

- **DISCONNECT** power (AC or solar and battery) **BEFORE** installing or servicing operator.

For continued protection against fire:

- Replace **ONLY** with fuse of same type and rating.

# INTRODUCTION

## OPERATOR SPECIFICATIONS + CARTON INVENTORY & OPERATOR DIMENSIONS

### OPERATOR SPECIFICATIONS

This model is intended for use in vehicular swing gate applications:

**Gate Classifications:** CLASS I, II, III, & IV

**Main AC Supply:** 120 Vac or 240 Vac (240 Vac option with Toroid Kit ONLY)

**Solar Power Max:** 24 Vdc at 60 watts max.

**Input Rating:** 8 Amps at 120 Vac or 1 Amp at 240 Vac

**Input Rating Excluding Accessory Outlets:** 2 Amps at 120 Vac or 1 Amp at 240 Vac

**\*Input Rating of Accessory Outlets:** 6 Amps at 120 Vac

**\*NOTE:** The accessory outlets are not connected for the 240 Vac rating.

**Main Supply (Motor):** 24 Vdc

**Accessory Power:** 24 Vdc 500 mA Max for ON or SW (switched)

**NOTE:** Increased accessory power drawn from the operator will reduce solar performance (solar applications ONLY).

**Full Cycle Time:** 32 seconds (90 degree opening)

**Maximum Travel Range:** 115 degrees

**Maximum Gate Weight/Length:**

- 1600 lbs./8 foot
- 800 lbs./16 foot
- 600 lbs./18 foot

**Ambient Temperature:** -40°C to 60°C (-40°F to 140°F)

**Fuse Protection Battery:** 30 Amp

**Fuse Protection DC Power:** 30 Amp

**Daily cycle rate:** 300 cycles/day

**Optional toroid transformer kit:**

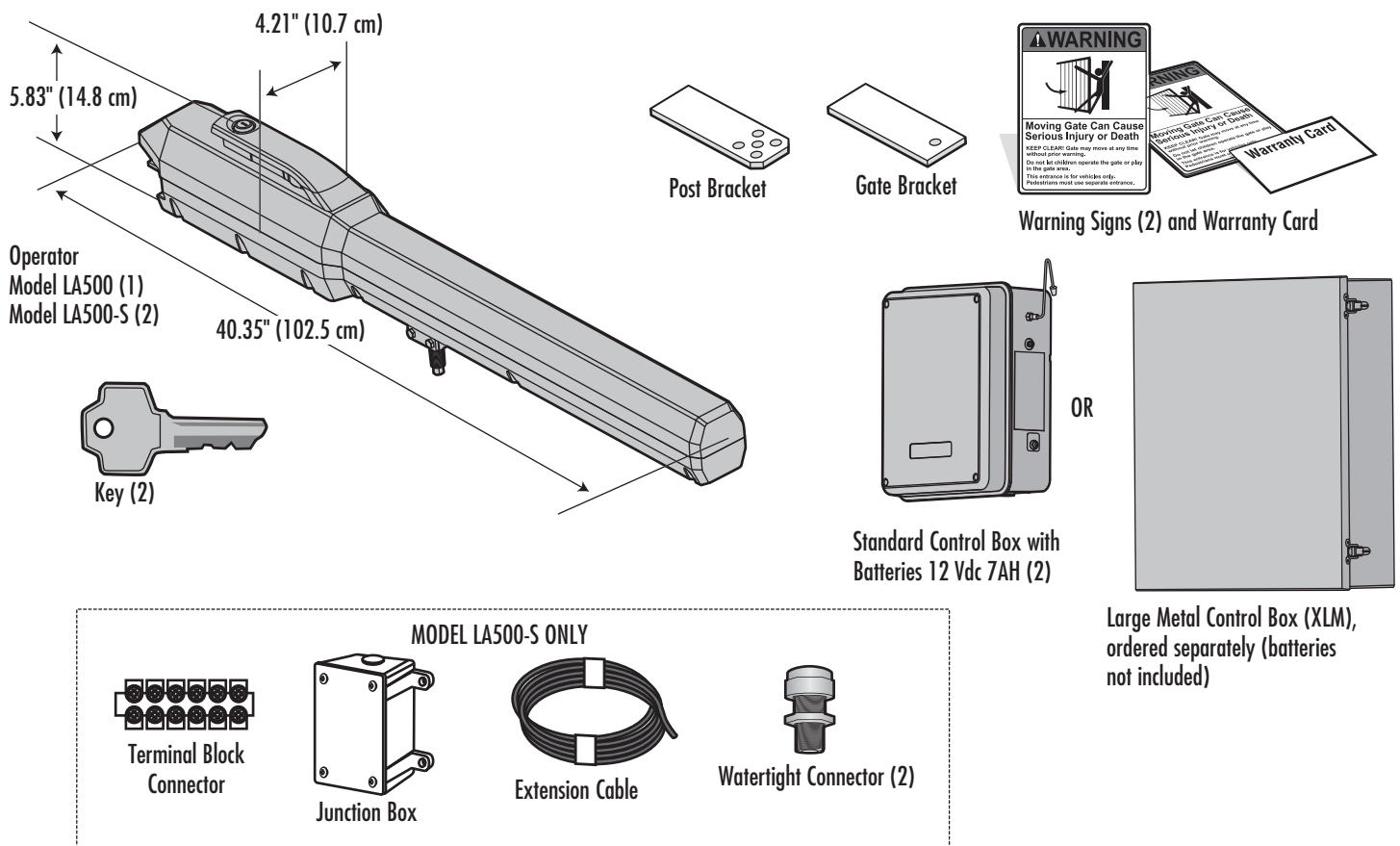
**120/240 Vac Operation**

**Cold Weather Applications:** -4°F for extended periods

**AC powered direct from toroid:** Batteries are used for backup only.  
Reduces the need for battery service.

### CARTON INVENTORY & OPERATOR DIMENSIONS

**NOT SHOWN:** Documentation Packet, Hardware Bag



## FEATURES

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### OPERATOR FEATURES

- Advanced “Centerpiece” Control Board
- 120 Vac Power Input (standard)
  - Optional Input Selection: 120 Vac (factory setting) or 240 Vac (Field change, optional toroid kit with AC Surge Protection and EMI Filter Board. Refer to accessory page.)
- Long life DC motor
- AC powered with integrated EverCharge® Power Management System
- 24 Vdc accessory power
- Programmable with up to 50 remote controls and 2 keyless entries. Compatible with MyQ® devices and Security+ 2.0™ codes at either 310, 315, 390 MHz, or 433 MHz
- SAMS compatible
- Slow-start and slow-stop gate motion
- Reset Button
- Audible Alarm
- Electronic limit adjustment and control from the remote control
- Lockable manual release handle

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### CONTROL BOARD FEATURES

- Electronic Limit adjustment and control
- Adjustable reversal force
- Adjustable Timer-to-Close (TTC)
- Maximum Run Timer
- Bipart Delay switch (dual gate applications)
- Feedback and Diagnostic LEDs
- Integrated Radio Receiver, Single Button Control (SBC) and 3-Button Station control, four radio frequencies supporting Security+ 2.0™
- COMMANDS:
  - OPEN, CLOSE, or STOP: accessory connection and on-board button
  - Single Button Close (SBC): accessory connection
  - FIRE DEPARTMENT OPEN: accessory connection
  - INTEGRATED RADIO RECEIVER
- LOOPS:
  - EXIT, SHADOW, or INTERRUPT LOOP: accessory connection

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### EXPANSION BOARD FEATURES

- Plug-in Loop Detector Connectors (Model LOOPDETLN Loop Detector)
  - SHADOW
  - INTERRUPT
  - EXIT, with Fail Open/Fail Close selection
- Quick-Close ON/OFF selection switch
- AC Fail Open/Battery selection switch
- Low Battery Open/Close selection switch
- Anti-Tail ON/OFF selection switch
- Single Button Control (SBC) accessory connection
- 3-Button station accessory connection
- AUX Relays (2) each independently selectable operation:
  - OPEN LIMIT: ON at open limit switch
  - CLOSE LIMIT: OFF at close limit switch
  - GATE MOVING: ON with gate moving
  - PRE-ALERT DELAY: ON 3 seconds before gate motion, option of using the onboard alarm.
  - TAMPER: ON when gate manually pulled from close limit, option of using the external buzzer through AUX relay 1 or 2 on expansion board.
  - POWER: ON with AC or Solar power available
  - CYCLE QUANTITY: LEDs blink operational cycle count

# PREPARATION

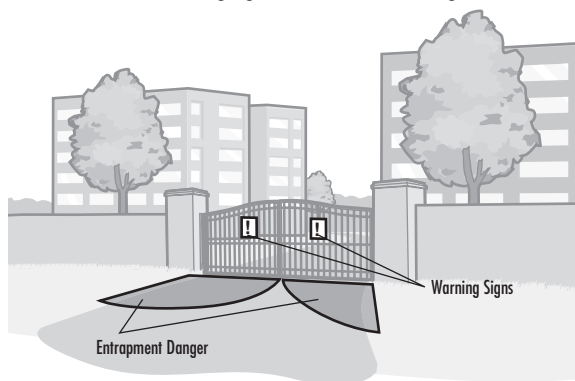
## SITE PREPARATION

Check the national and local building codes **BEFORE** installation.



### SAFETY

Entrapment protection devices are required to protect against any entrapment or safety conditions encountered in your gate application (refer to page 5 for more details). Install warning signs on both sides of the gate.



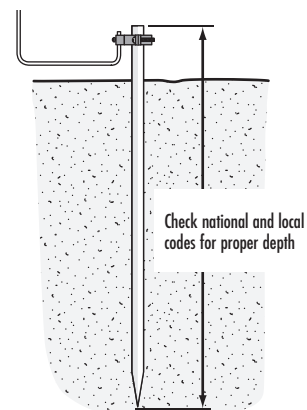
### VEHICLE LOOPS

The vehicle loops allow the gate to stay open when vehicles are obstructing the gate path. Suggested for vehicles 14 feet (4.27 m) or longer. Vehicle loops are not required but are recommended.



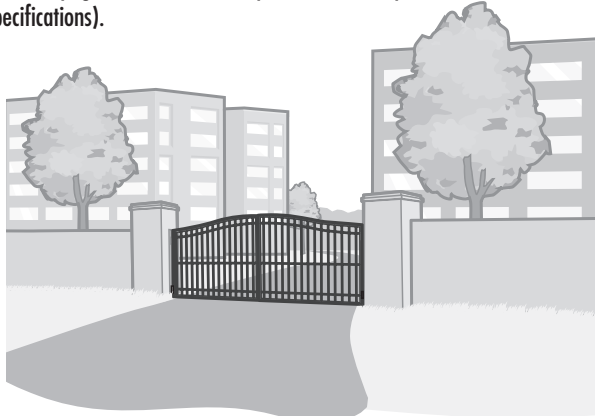
### EARTH GROUND ROD

Proper grounding gives an electrical charge, such as from an electrical static discharge or a near lightning strike, a path from which to dissipate its energy safely into the earth. Without this path, the intense energy generated by lightning could be directed towards the gate operator. Although nothing can absorb the tremendous power of a direct lightning strike, proper grounding can protect the gate operator in most cases.



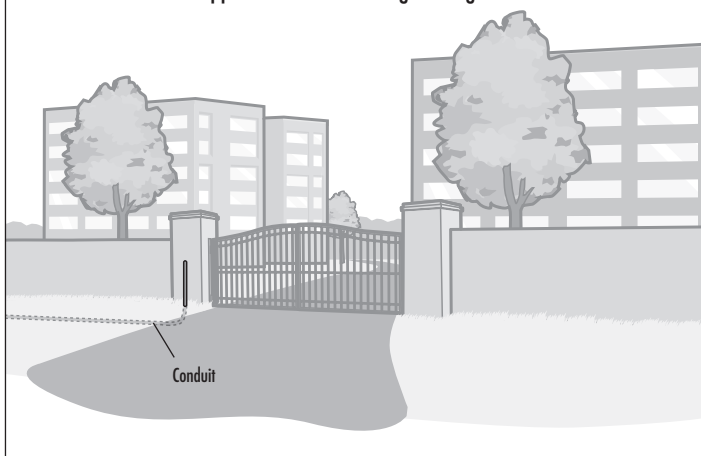
### GATE

Gate must be constructed and installed according to ASTM F2200 standards (refer to page 4). Gate must fit specifications of operator (refer to specifications).



### CONDUIT

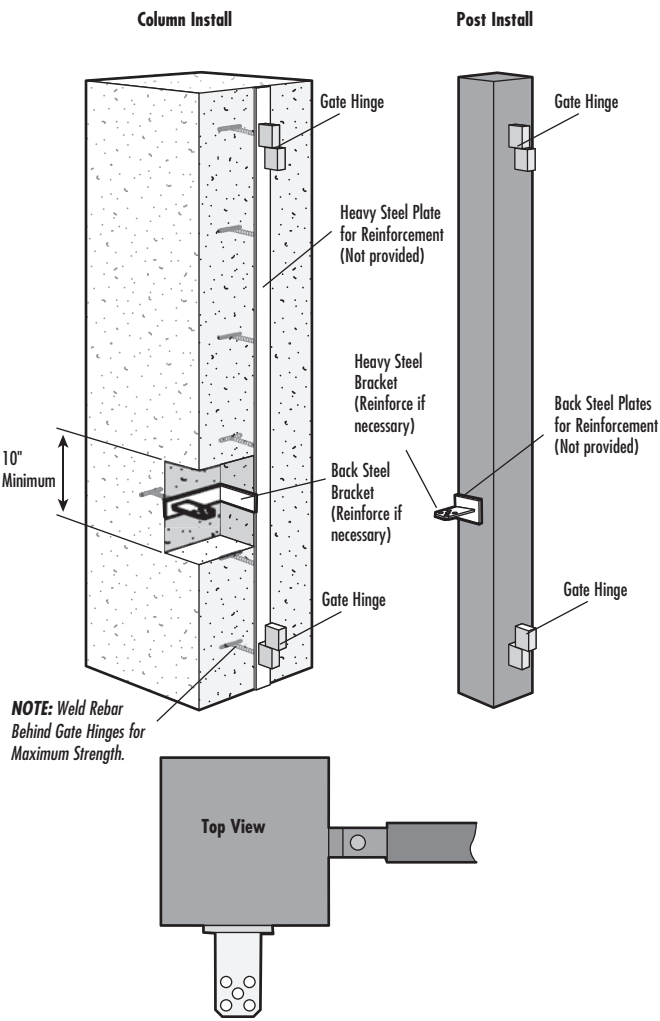
Conduit must be UL approved for low and high voltage.



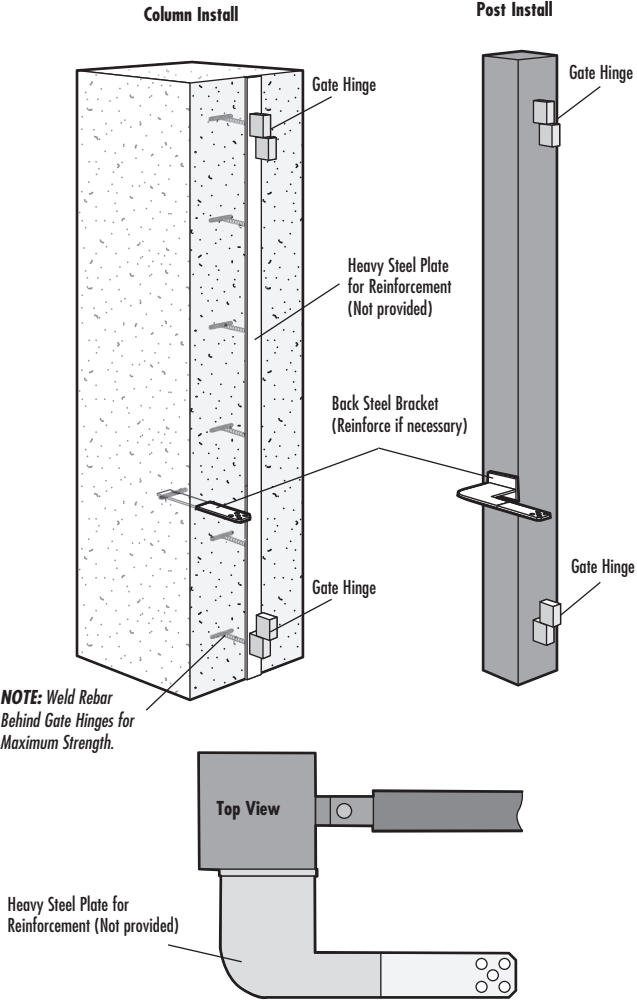
INSTALLATION TYPES

Identify your installation type. The installation steps in this manual will show a typical Pull-to-Open application.

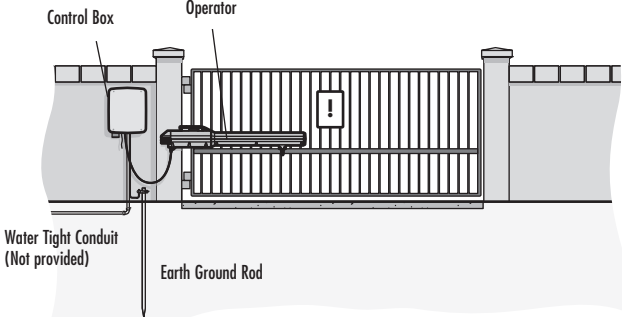
PULL-TO-OPEN



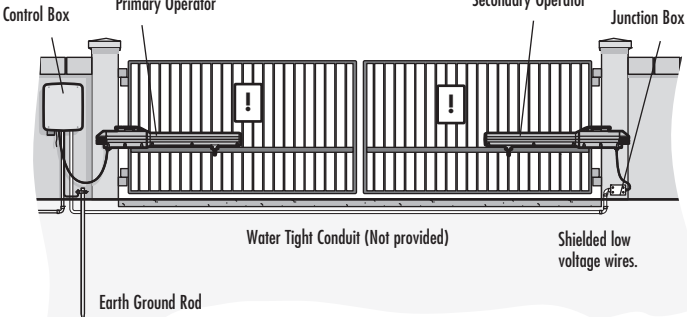
PUSH-TO-OPEN



SINGLE GATE



DUAL GATE

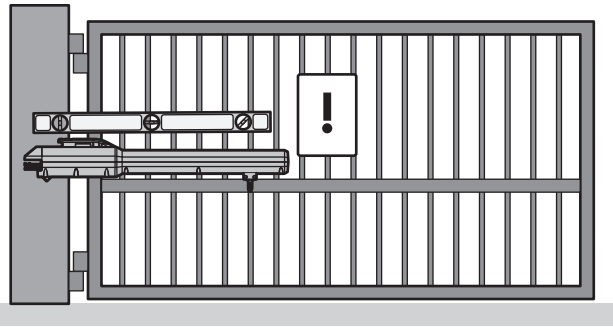


# PREPARATION

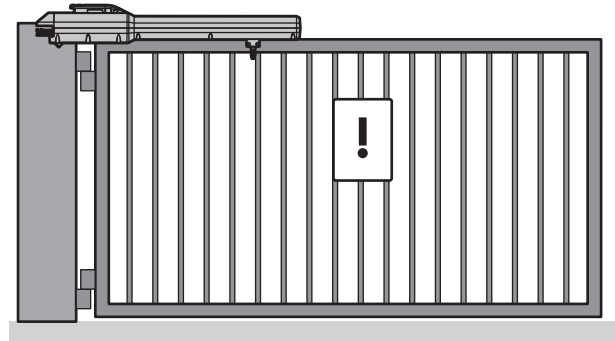
## MOUNTING OPTIONS

### MOUNTING OPTIONS

#### MOUNTING DO's

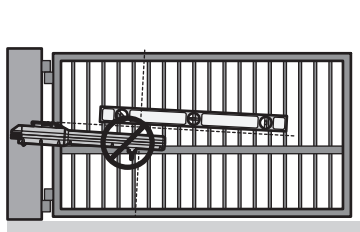


Weld a horizontal bar across entire gate on any installation for strength.  
Make sure that the operator is mounted level or it will not function properly.

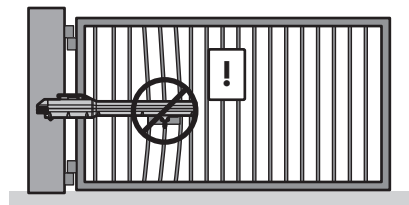
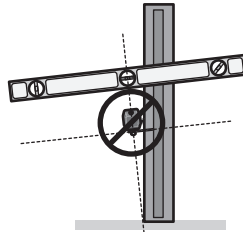


The operator can be mounted on top of the gate frame.

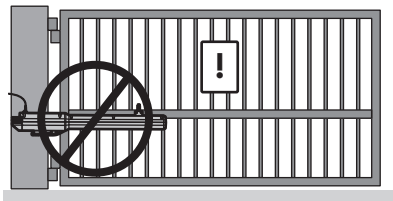
#### MOUNTING DON'Ts



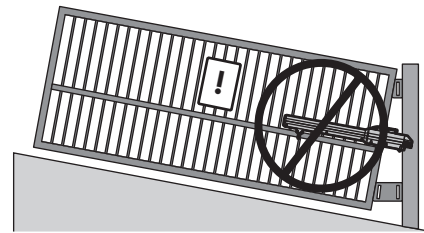
An off-level installation may cause the gate or operator to fail prematurely.



DO NOT weld the crossbar on just a few pickets, or they could bend.



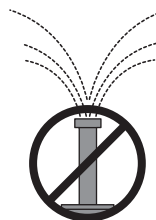
DO NOT install upside down.



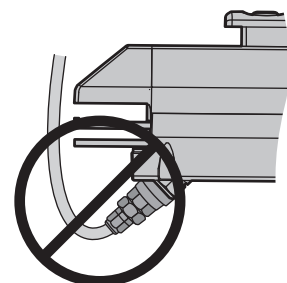
DO NOT install on uphill or downhill gates.



DO NOT install on ANY pedestrian passageways, doorways, or gates.



DO NOT install next to sprinklers  
or any area that may expose  
the bottom of operator to water.



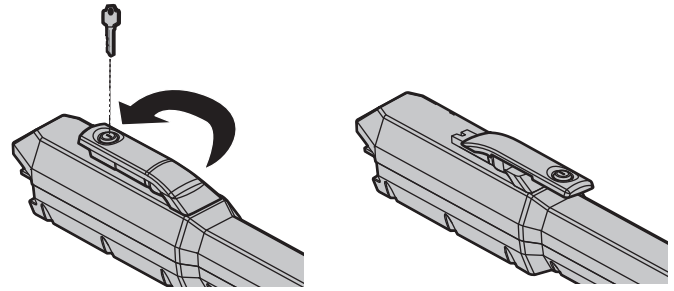
DO NOT over-bend the cord from the operator.  
Doing this will cause the wires to eventually break.

# INSTALLATION

## MANUAL RELEASE + DETERMINE THE POSITION OF THE POST BRACKET

### MANUAL RELEASE

- 1 Insert the key into the lock and turn it 180 degrees counterclockwise.
- 2 Turn the release lever 180 degrees counterclockwise. The operator is now in manual mode.

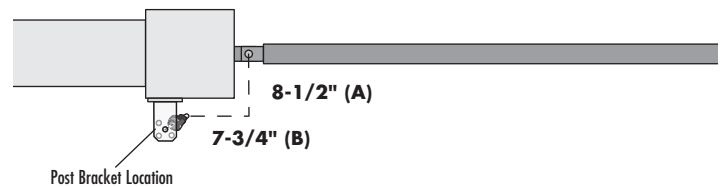
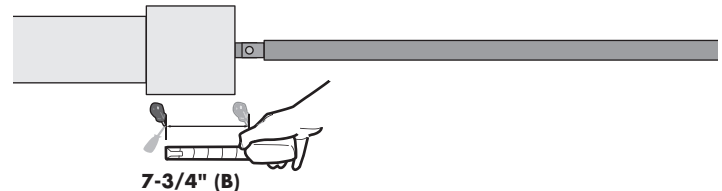
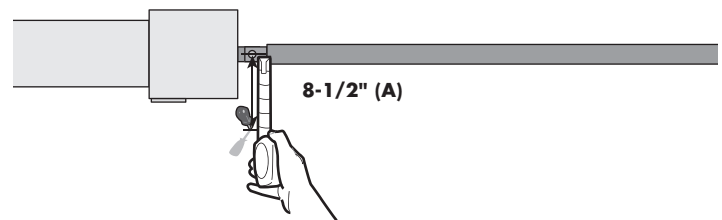


If this operator is a replacement for a Miracle-One™ operator, use the existing post bracket and gate bracket. Remove the Miracle-One™ operator from the brackets and proceed to page 15.

### DETERMINE THE POSITION OF THE POST BRACKET

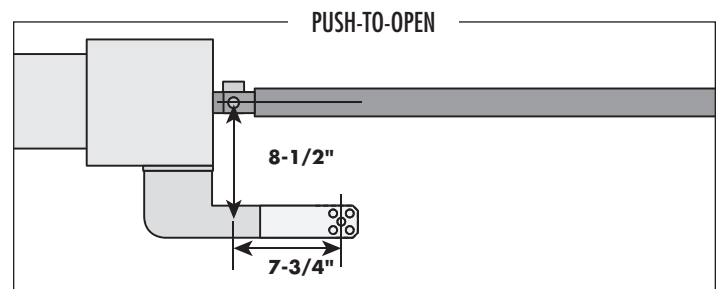
The measurements shown below are typical for a standard installation. Your installation may be different. For optimal mechanical advantage the measurement for A must be larger than the measurement for B.

- 1 Close the gate.
- 2 Choose a vertical mounting location for the post bracket.
- 3 Place a measuring tape under the center of the gate hinge point and measure out 8-1/2 inches (A).
- 4 Use a screwdriver or dowel rod to temporarily mark the location of the first measurement.
- 5 Measure 7-3/4 inches (B) from the previous mark.
- 6 Use a screwdriver to mark the location of the second measurement.
- 7 Align the post bracket as close as possible above the screwdriver or dowel rod and tack weld the post bracket in the desired vertical position.



If your application is Push-to-Open, refer to the illustration to the right.

Alternative A & B dimensions			
A	B	C	D
8-1/2"	7-3/4"	35-1/2"	6-1/2"
7-3/4"	8-1/2"	35-1/2"	6-1/2"
9"	9"	35-1/2"	6-1/2"
9"	8-1/2"	35-1/2"	6-1/2"
7-1/2"	7-1/2"	35-1/2"	6-1/2"





# INSTALLATION

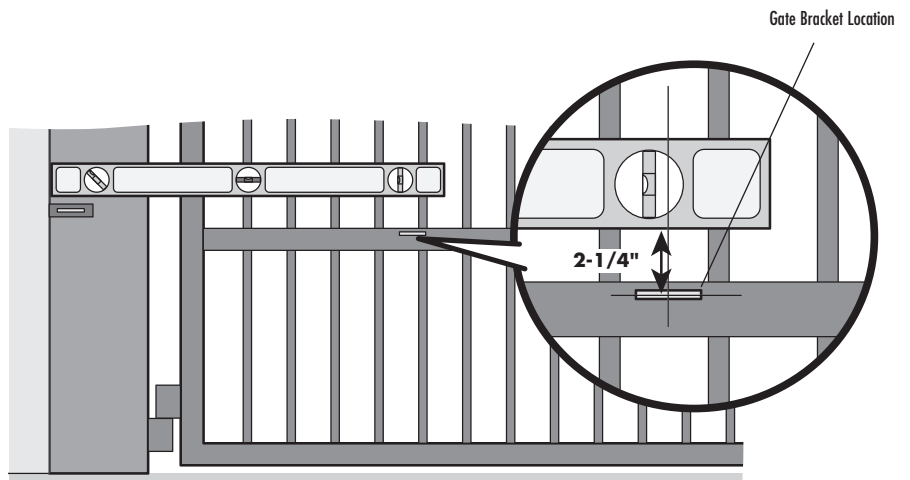
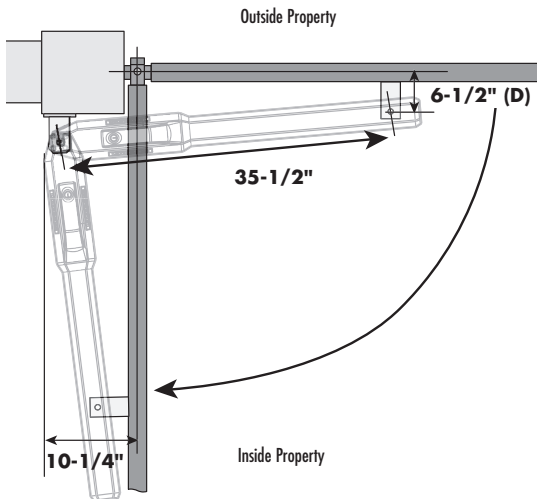
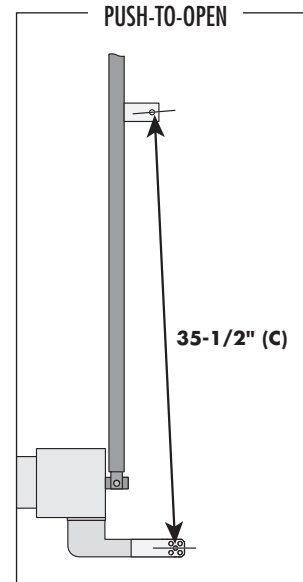
## DETERMINE THE POSITION OF THE GATE BRACKET + WELD THE BRACKETS

### DETERMINE THE POSITION OF THE GATE BRACKET

The gate bracket **MUST** be installed in an area that can withstand heavy forces. Additional reinforcement steel plates may be necessary for mounting.

- 1 Position a level on the post bracket and measure 35-1/2 inches over from the center hole of the post bracket and mark the location on the gate.
- 2 Measure 2-1/4 inches down from the previous mark and center the bracket on this mark. Tack weld the gate bracket in this position.

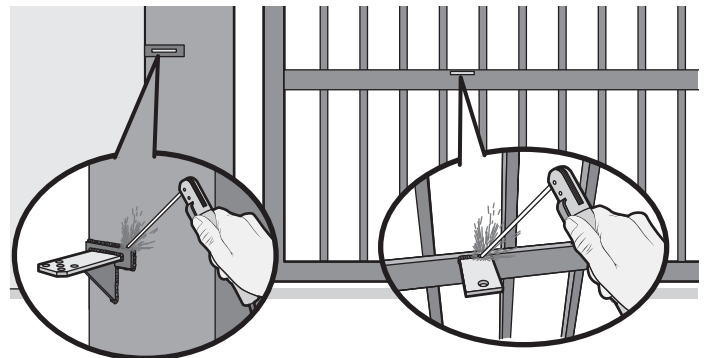
**NOTE:** While the gate is in the fully open position, the operator needs a clearance of 10-1/4 inches as shown.



### WELD THE BRACKETS

- 1 Position the operator on the brackets and make sure the operator is level and positioned correctly on the gate.
- 2 Remove the operator from the gate.
- 3 Completely weld around the post bracket and gate bracket.

**NOTE:** Brackets may need additional reinforcement by welding flat stock as shown.



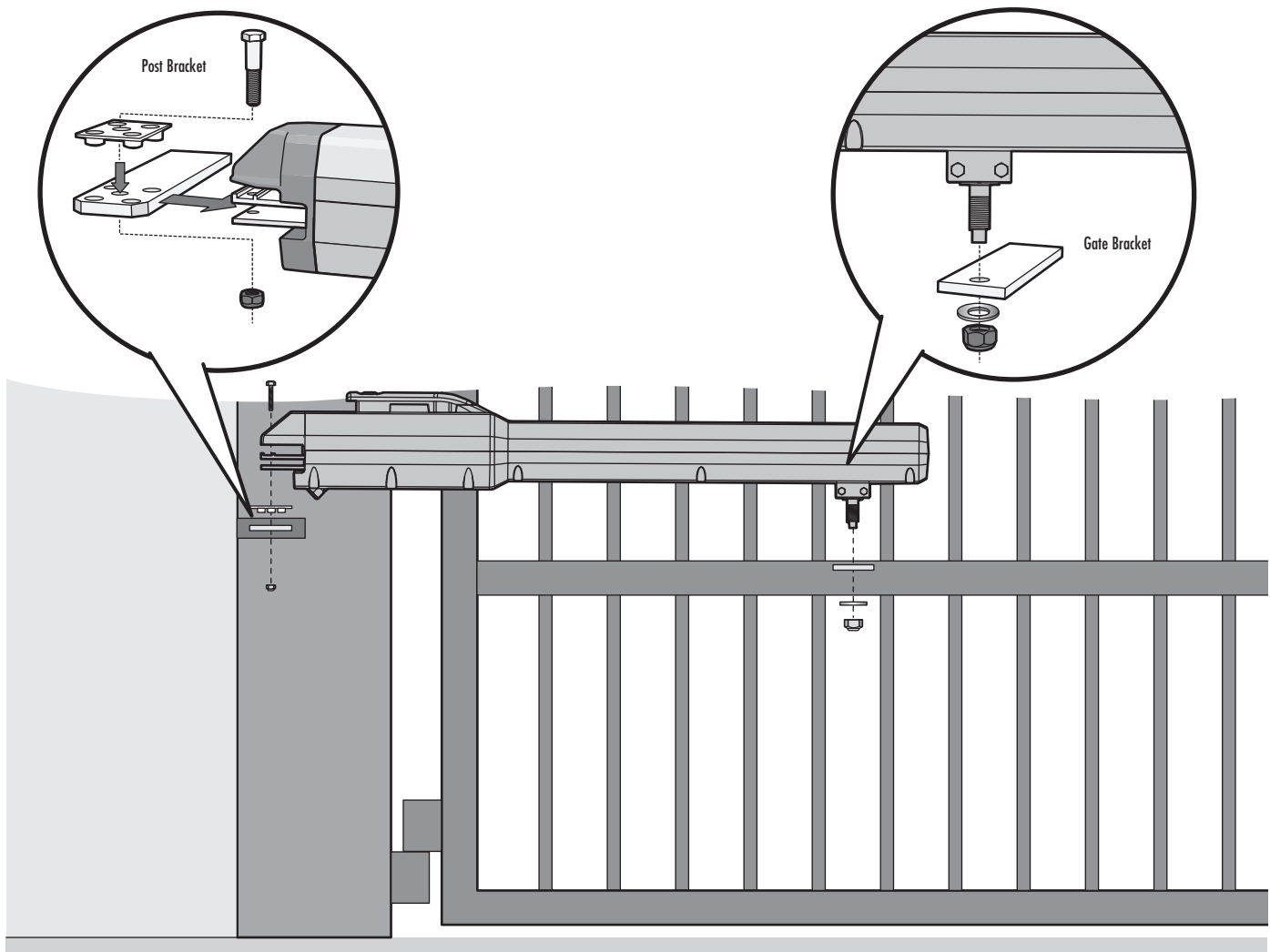
# INSTALLATION

## ATTACH THE OPERATOR TO THE BRACKETS

### ATTACH THE OPERATOR TO THE BRACKETS

- 1 Attach the operator to the post bracket with the bolt, mounting plate, and nut as shown.
- 2 Attach the operator to the gate bracket with the bolt, washer, and nut as shown. Tighten the nut until it reaches the bottom of the gate bracket, then turn the nut a half turn, making sure not to overtighten. Make sure the trolley does not reach the fully open or fully closed position.

**NOTE:** Extra force may be needed to move the trolley back and forth.



For dual gate applications, repeat the previous installation steps to install the second operator.

# INSTALLATION

## STANDARD CONTROL BOX

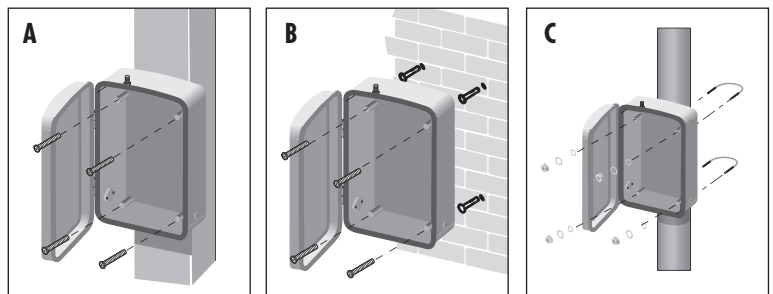
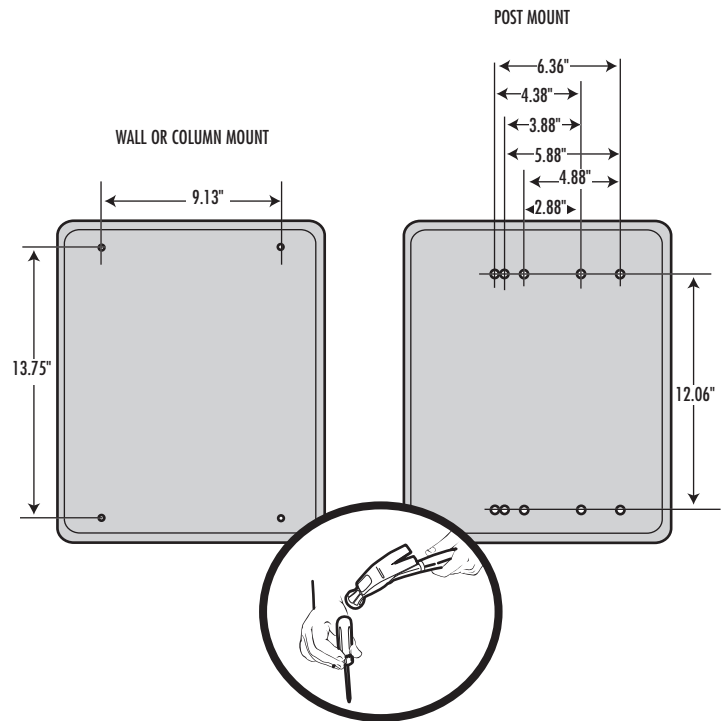
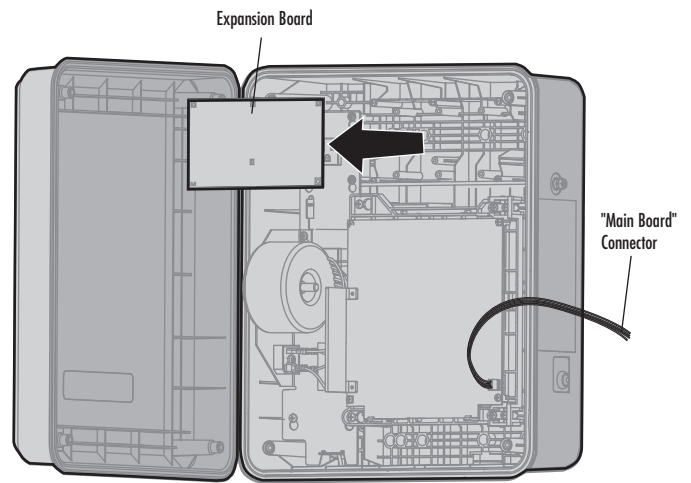
For Large Metal Control Box installation, refer to the following page.

### STANDARD CONTROL BOX

#### MOUNT THE CONTROL BOX

The control box MUST be mounted within 5 feet (1.52 m) of the gate operator. Mount the control box as high as possible for best radio reception. Make sure the control box is level. **NOTE:** The expansion board DOES NOT need to be removed for a wall or column mount installation.

- 1 Remove the screws and open the control box.
- 2 Disconnect the connector labeled "Main Board" on the expansion board.
- 3 Remove the expansion board by removing the screws.
- 4 Select the mounting holes and remove the knockouts using a screwdriver and hammer.
- 5 Secure the control box to mounting surface.
  - A. **Column:** Use the provided screws (4).
  - B. **Wall:** Use the provided screws (4).
  - C. **Post:** Use U-bolts and rubber washers (not provided) to ensure a watertight seal. Make sure the U-bolts do not protrude more than 3/4 inch from the control box because this can short the control board.
- 6 Reinstall the expansion board and connect the "Main Board" connector to the expansion board.



# INSTALLATION

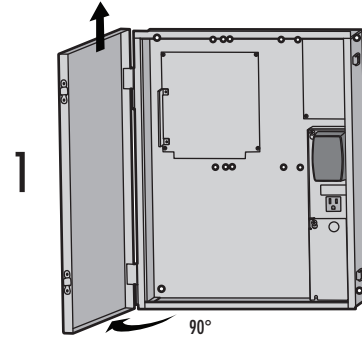
## LARGE METAL CONTROL BOX (XLM)

### LARGE METAL CONTROL BOX (XLM)

#### MOUNT THE CONTROL BOX (XLM)

The control box **MUST** be mounted within 5 feet (1.52 m) of the gate operator. Mount the control box as high as possible for best radio reception. Make sure the control box is level.

- 1 Open the control box. The control box door may be removed by opening the door 90°. Lift the door from the hinges and set aside until the installation is complete.

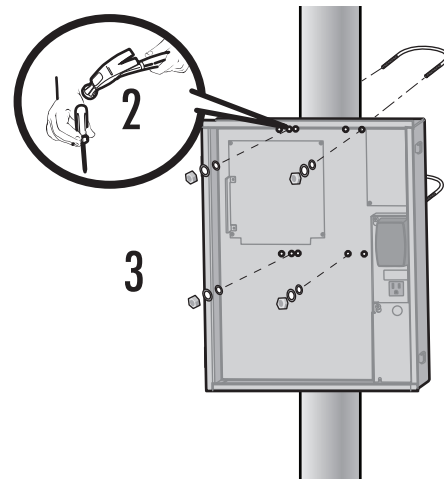


#### POST MOUNT

**NOTE:** The post mount option is not recommended for the 33AH battery application.

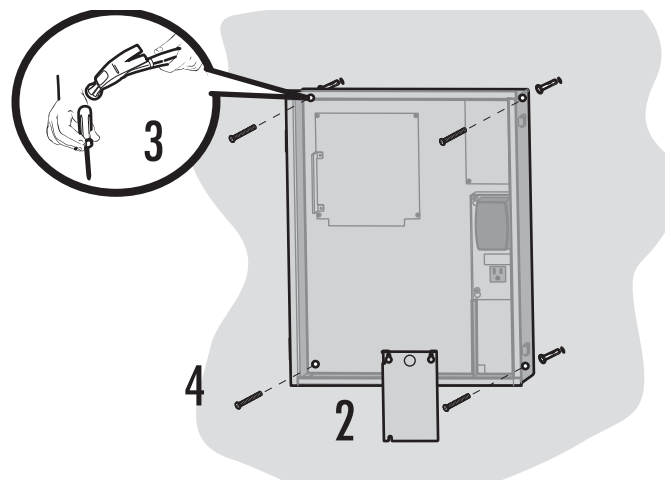
- 2 The control box can be mounted to a post with 'U' bolts (refer to chart). The knock out will accommodate a 3/8" diameter 'U' bolt. Select center mounting holes (top and bottom) and knock out using a screwdriver and hammer.
- 3 Secure the control box to mounting surface with U-bolts and rubber washers (not provided) to ensure a watertight seal.

TYPE AND SIZE	'U' BOLT OPENING
Standard 3" Round Pipe	3-1/2"
Standard 4" Square Post	4"
Standard 6" Square Post	6"



#### WALL OR COLUMN MOUNT

- 2 Remove the electrical outlet cover by loosening the screws and sliding the cover up.
- 3 Use knock outs located at the 4 corners of the control box and knock out using a screwdriver and hammer.
- 4 Secure the control box to mounting surface using the provided screws (4).



# WIRING

## WIRE THE ENTRAPMENT PROTECTION DEVICES + EARTH GROUND ROD

### WIRE THE ENTRAPMENT PROTECTION DEVICES

Entrapment protection devices are required. Refer to page 5 for more information regarding application.

#### ⚠ WARNING

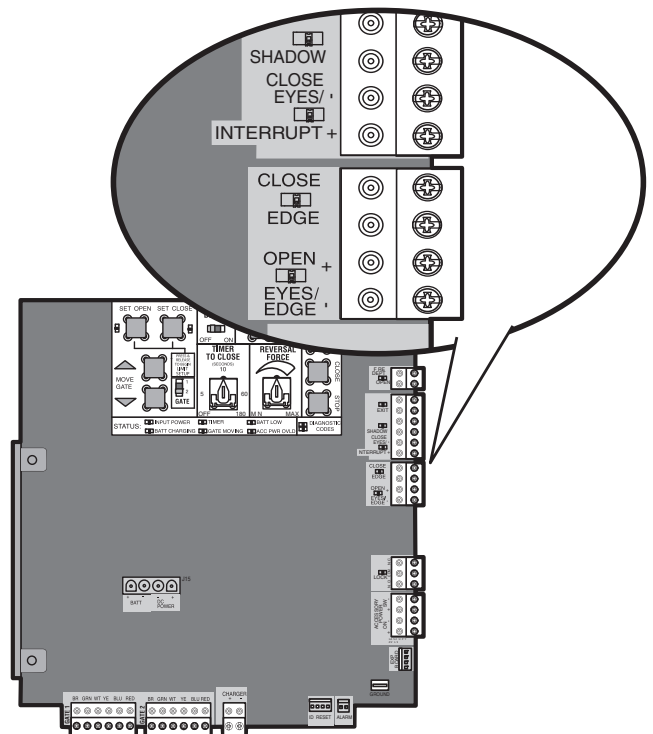
To prevent **SERIOUS INJURY** or **DEATH** from a moving gate:

- Entrapment protection devices **MUST** be installed to protect anyone who may come near a moving gate.
- Locate entrapment protection devices to protect in **BOTH** the open and close gate cycles.
- Locate entrapment protection devices to protect between moving gate and **RIGID** objects, such as posts or walls.

There are three options for wiring the entrapment protection devices depending on the specific device and how the device will function. Refer to the wiring diagram or the specific product manual for more information.

- 1 Connect the entrapment protection device to the **EYES EDGE** terminal on the control board. These inputs are for pulsed photoelectric sensors and dry contact edges.
  - Close Photoelectric Sensor Entrapment Protection: Connect wires from the photoelectric sensors to the Inputs on the **CLOSE EYES/INTERRUPT** terminal.
  - Close Edge Entrapment Protection: Connect wires from the entrapment protection device to the Inputs on the **CLOSE EDGE** terminal.
  - Open Entrapment Protection: Connect wires from the entrapment protection device to the Inputs on the **OPEN EYES/EDGE** terminal.

**NOTE:** Refer to the "Wiring Accessories to the Control Board" section on page 33.



### TO ERASE LEARNED MONITORED PHOTOELECTRIC SENSORS

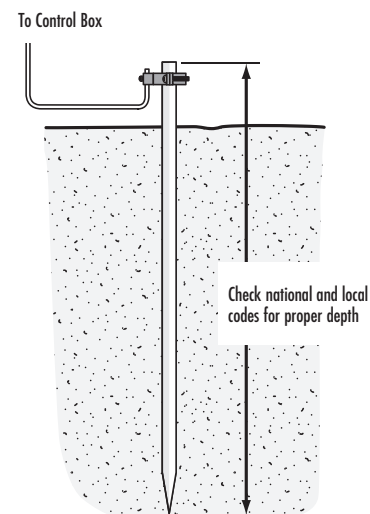
- 1 Remove the photoelectric sensor wires from the terminal block.
- 2 Press and release the **SET OPEN** and **SET CLOSE** buttons simultaneously. The **SET OPEN** and **SET CLOSE** LEDs will turn on (entering learn limit mode).
- 3 Press and release both **SET OPEN** and **SET CLOSE** buttons again to turn off the **SET OPEN** and **SET CLOSE** LEDs (exiting learn limit mode).

### EARTH GROUND ROD

Use the proper earth ground rod for your local area. The ground wire must be a single, whole piece of wire. Never splice two wires for the ground wire. If you should cut the ground wire too short, break it, or destroy its integrity, replace it with a single wire length.

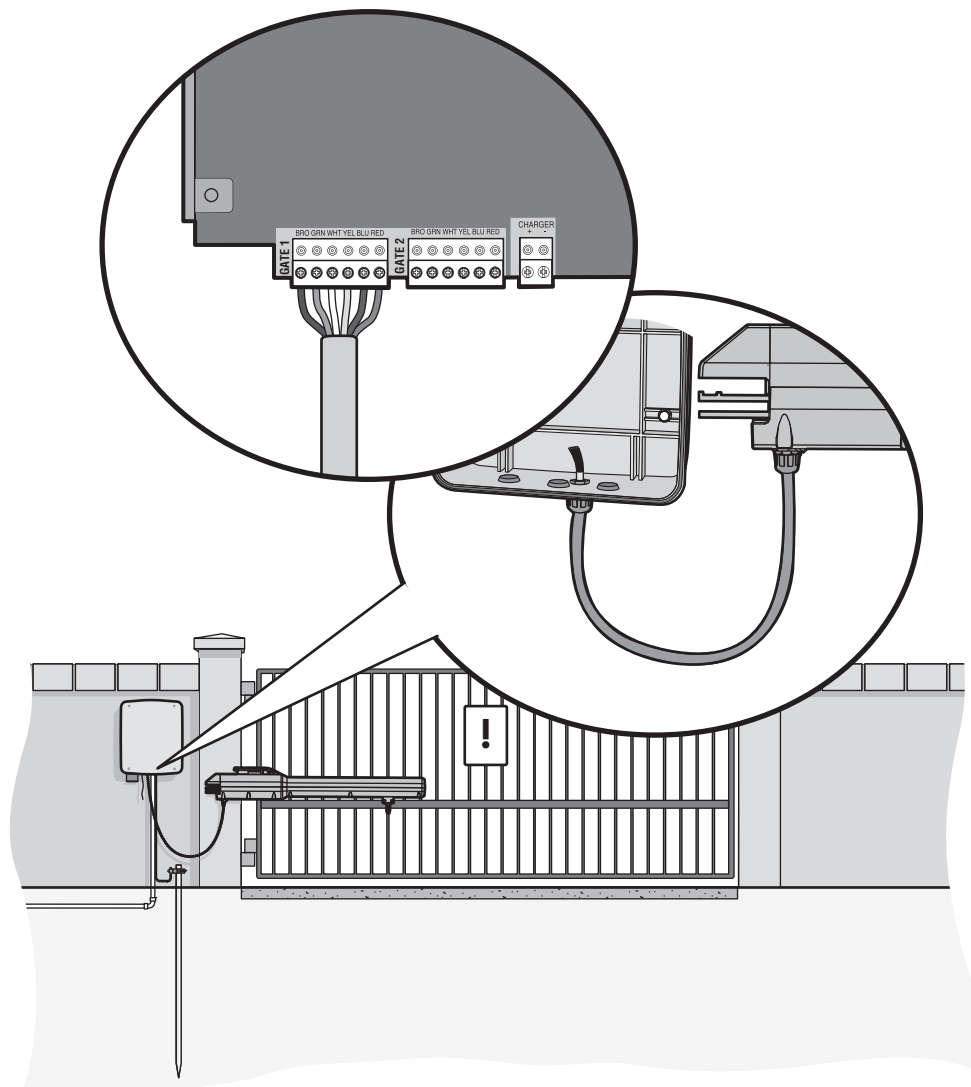
- 1 Install the earth ground rod within 3 feet of the control box.
- 2 Run wire from the earth ground rod to the control box. The earth ground wire will be connected in a later step.

**NOTE:** If the operator is not grounded properly the range of the remote controls will be reduced.



### WIRE THE OPERATOR ARM TO THE CONTROL BOARD

- 1 Insert the operator cable through the watertight connector (provided) as shown.
- 2 Extend the operator cable and wires to the **Gate 1** connector and connect as shown.
- 3 Tighten watertight connector nut.



If installing one operator, proceed to page 22. If installing two operators, continue to the next page.

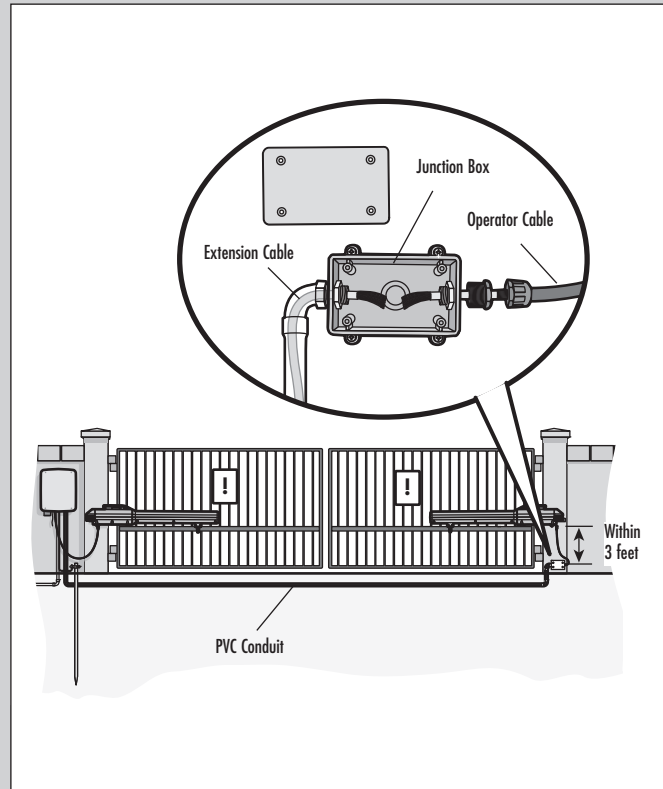
## DUAL GATES ONLY

### INSTALL THE EXTENSION CABLE AND JUNCTION BOX

Before digging, contact local underground utility locating companies. The following items are required to complete the junction box installation:

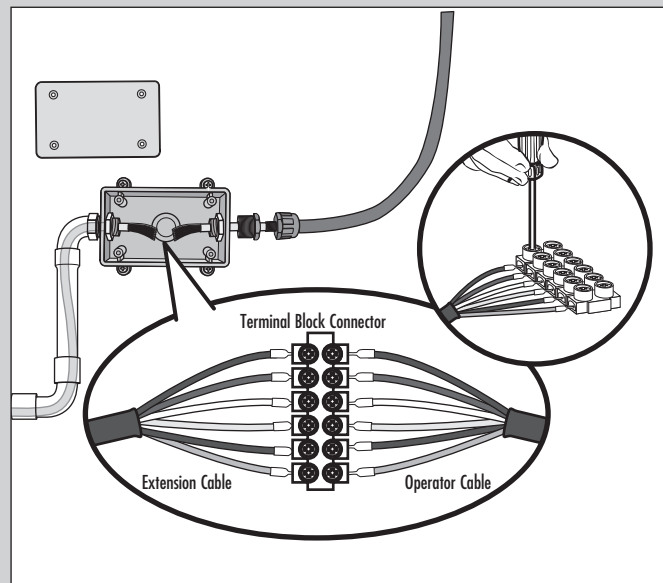
- 4 x 4 Junction Box with 3/4" NPT threaded port holes
- Screws
- PVC Conduit

- 1 Trench across driveway to bury the extension cable. Use PVC conduit to prevent damage to cables.
- 2 Open the junction box by removing screws (4) and set aside.
- 3 Mount the junction box within 3 feet (0.9 m) of second operator.
- 4 Route operator cable and extension cable through watertight connector nut and watertight connector.
- 5 Insert cables and watertight connectors into the holes in the bottom of the junction box (not provided).
- 6 Feed extension cable through PVC conduit and secure with nut.



### WIRE THE EXTENSION CABLE TO THE SECONDARY OPERATOR

- 1 Insert wires from extension cable and operator cable into the terminal block connector as shown (like-colored wires must face each other).
- 2 Put wires inside of junction box.
- 3 Secure operator and extension cables with watertight connector nut.
- 4 Reinstall cover.

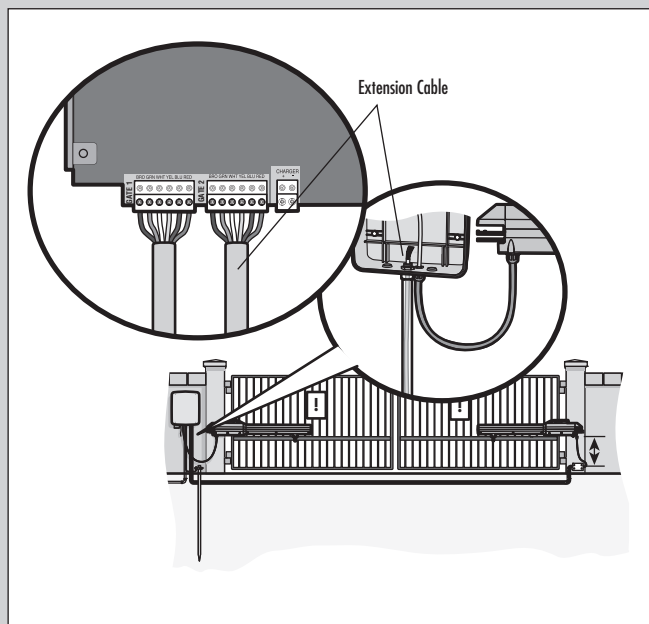




### DUAL GATES ONLY CONTINUED...

#### WIRE THE EXTENSION CABLE TO THE CONTROL BOARD

- 1 Choose a knockout in the bottom of the control box.
- 2 Insert a watertight connector through the knockout and tighten with nut.
- 3 Insert the extension cable through watertight connector.
- 4 Extend the cable and wires to **Gate 2** connector on the control board. Connect wires as shown.
- 5 Tighten the watertight connector nut to secure extension cable to control box.



#### SET THE BIPART DELAY

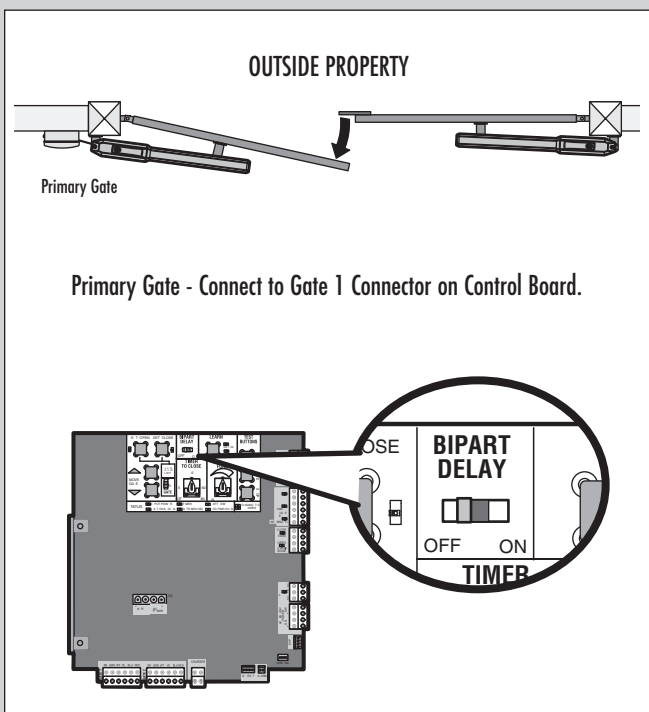
Occasionally in dual gate installations, one gate will need to open first and close second. This would happen if there was an ornamental overhang on one gate or if using a solenoid lock, for example. This gate is called the Primary gate and needs to be connected to Gate 1 connections on the control board. Thus, it is preferred that the control box be installed on the same side as this gate. If there is no appropriate location on that side for the control box, then mount the control box on the opposite side, but connect the operator closest to the control box to the Gate 2 connector and the operator on the opposite side to the Gate 1 connector.

**NOTE:** The gate with the longer travel span (opening) must be set as the primary gate (GATE 1).

- 1 The BIPART DELAY switch on the control board needs to be set to the ON position.

The following illustration shows a dual gate configuration with a decorative overlapping piece on the outside of the gate.

If a solenoid lock is being used on a gate, the gate with the lock attached to it is the primary gate.



# WIRING

## POWER WIRING INTRODUCTION + POWER WIRING (STANDARD CONTROL BOX)

### POWER WIRING INTRODUCTION

The standard control box can be wired for either 120 Vac or 240 Vac. Factory default is 120 Vac. The Large Metal Control Box (XLM) can be wired for 120 Vac (default) or it can be wired for 240 Vac with the optional toroid transformer kit (refer to Accessories).

The batteries are charged in the circuit by the toroid transformer, plug-in transformer, or the solar panels. Main power supply and control wiring **MUST** be run in separate conduits.

Follow the directions according to your application. For solar applications proceed to Solar Panels section on page 24.

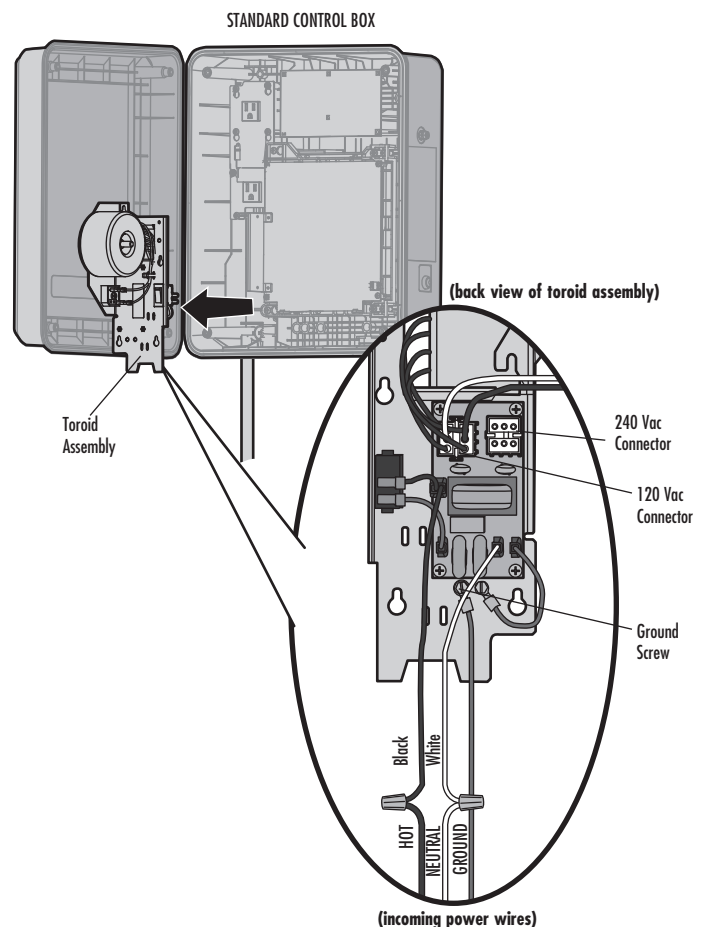
**NOTE:** If using an external receiver use shielded wire for the connections or mount the receiver away from the operator to avoid interference with the operator.

AMERICAN WIRE GAUGE (AWG)	MAXIMUM WIRE LENGTH (120 VAC)	MAXIMUM WIRE LENGTH (240 VAC)
14	130 feet	260 feet
12	205 feet	410 feet
10	325 feet	650 feet
8	520 feet	1040 feet
6	825 feet	1650 feet
4	1312 feet	2624 feet

**NOTE:** Use copper conductors **ONLY**.

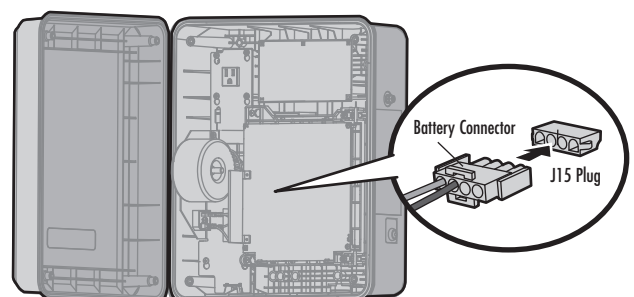
### POWER WIRING (STANDARD CONTROL BOX)

- 1 Turn off the AC power from the main power source circuit breaker.
- 2 Run the AC power wires to the control box.
- 3 Remove the toroid assembly from the control box by loosening the four screws and lifting the assembly up and out.
- 4 Ensure the 120/240 plug is connected to either the 120 or 240 Vac connector on the EMI board depending on your application. Factory default is 120 Vac.
- 5 Connect the ground wire to the ground screw on the back of the toroid assembly.
- 6 Connect the white wire from the toroid assembly to NEUTRAL using a wire nut.
- 7 Connect the black wire from the toroid assembly to HOT using a wire nut.
- 8 Replace the toroid assembly and tighten the four screws. Ensure the wires are not pinched.



### CONNECT BATTERIES

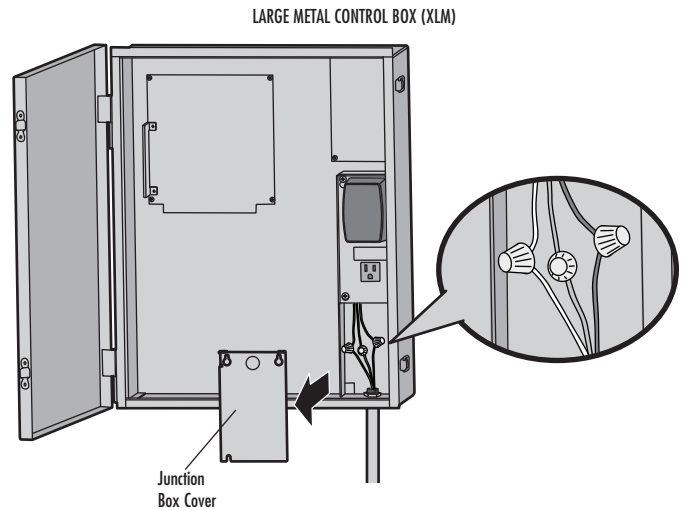
- 1 Plug the battery connector to the J15 plug labeled BATT(-)(+) DC(-)(+) on the control board. The control board will power up. **NOTE:** You may see a small spark when plugging the J15 plug into the board.
- 2 Turn ON AC power to the operator.



### POWER WIRING (LARGE METAL CONTROL BOX [XLM])

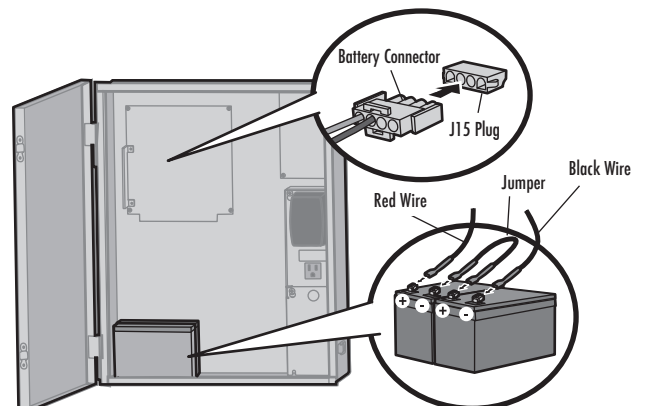
**NOTE:** Wiring the Large Metal Control Box for 240 Vac will require the optional toroid transformer kit (refer to Accessories).

- 1 Turn OFF AC power to the operator at the circuit breaker and unplug the transformer.
- 2 Run the AC power wires to the control box.
- 3 Remove the junction box cover.
- 4 Connect the green wire to the earth ground rod wire using a wire nut.
- 5 Connect the white wire to NEUTRAL using a wire nut.
- 6 Connect the black wire to HOT using a wire nut.
- 7 Replace the junction box cover. Ensure the wires are not pinched.



### CONNECT BATTERIES

- 1 Unplug the battery connector to the J15 plug labeled BATT(-)(+) DC(-)(+) on the control board by squeezing the plug and pulling it from the control board.
- 2 Connect a jumper between the positive (+) terminal of one battery to the negative (-) terminal of the other battery.
- 3 Connect the red wire from the J15 plug labeled BATT (+) to the positive (+) terminal of the battery.
- 4 Connect the black wire from the J15 plug labeled BATT (-) to the negative (-) terminal of the battery.
- 5 Plug the J15 plug into the control board. The control board will power up.  
**NOTE:** You may see a small spark when plugging the J15 plug into the board.
- 6 Plug the transformer in.
- 7 Turn ON AC power.



### POWER WIRING (SOLAR PANELS)

NUMBER OF CYCLES PER DAY (SOLAR)									
Swing Gate Installation (12 ft. 800 lb. gate)									
Single Gate					Dual Gates				
Two 33AH Batteries required	ACCESSORY POWER DRAW (mA)	ZONE 1 (6 Hrs Sunlight/day)	ZONE 2 (4 Hrs Sunlight/day)	ZONE 3 (2 Hrs Sunlight/day)	Two 33AH Batteries required	ACCESSORY POWER DRAW (mA)	ZONE 1 (6 Hrs Sunlight/day)	ZONE 2 (4 Hrs Sunlight/day)	ZONE 3 (2 Hrs Sunlight/day)
20W SOLAR PANEL	0	118	66	43	20W SOLAR PANEL	0	51	28	18
	50	71	25	N/A		50	31	11	N/A
	100	30	N/A	N/A		100	13	N/A	N/A
40W SOLAR PANEL	0	283	166	112	40W SOLAR PANEL	0	122	71	48
	50	227	116	66		50	98	50	28
	100	174	69	25		100	75	30	11
	200	76	N/A	N/A		200	32	N/A	N/A
60W SOLAR PANEL	0	300	270	185	60W SOLAR PANEL	0	195	116	79
	50	300	215	134		50	169	92	57
	100	300	162	86		100	143	69	37
	300	116	N/A	N/A		300	50	N/A	N/A

#### SOLAR PANELS ARE NOT PROVIDED. SEE ACCESSORIES.

##### Solar Application requirements:

- Large Metal Control Box (XLM)
- A minimum of two 10W solar panels (Model SOLPNL10W12V) in series
- A maximum of six 10W solar panels (Model SOLPNL10W12V). Configuration of three sets of two 10W paralleled panels put in series.
- Two 33AH Batteries (Model A12330SGLPK)
- Solar Battery Harness (Model LA500SLRHARN)
- Battery Tray (Model K10-36183)

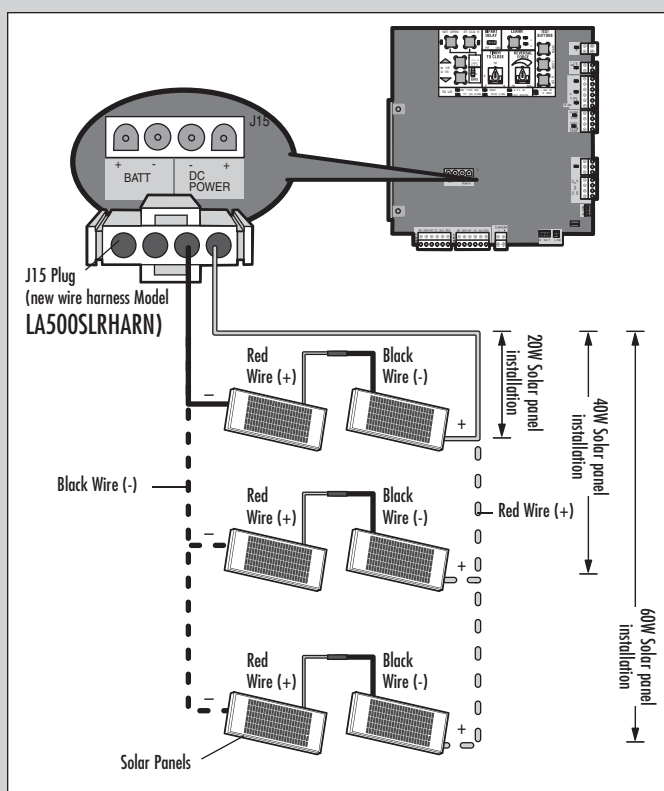
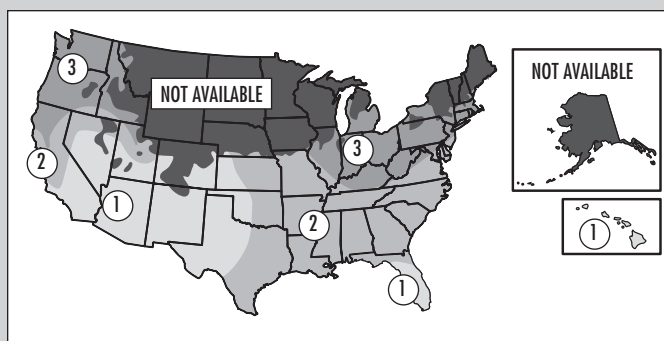
We recommend LiftMaster low power draw accessories to minimize power draw, refer to accessory page. Disconnect the expansion board for solar applications.

**NOTE:** Input solar power is 24 Vdc at 60 watts maximum.

The solar panel(s) must be located in an open area clear of obstructions and shading for the entire day. The gate operator is not supported in northern climates where temperatures reach below -4°F. This is due to cold weather and a reduced number of hours of sunlight during the winter months. Cycle rate may vary from solar chart for areas that reach below 32°F. Solar panels should be cleaned on a regular basis for best performance to ensure proper operation.

#### WIRE THE SOLAR PANELS

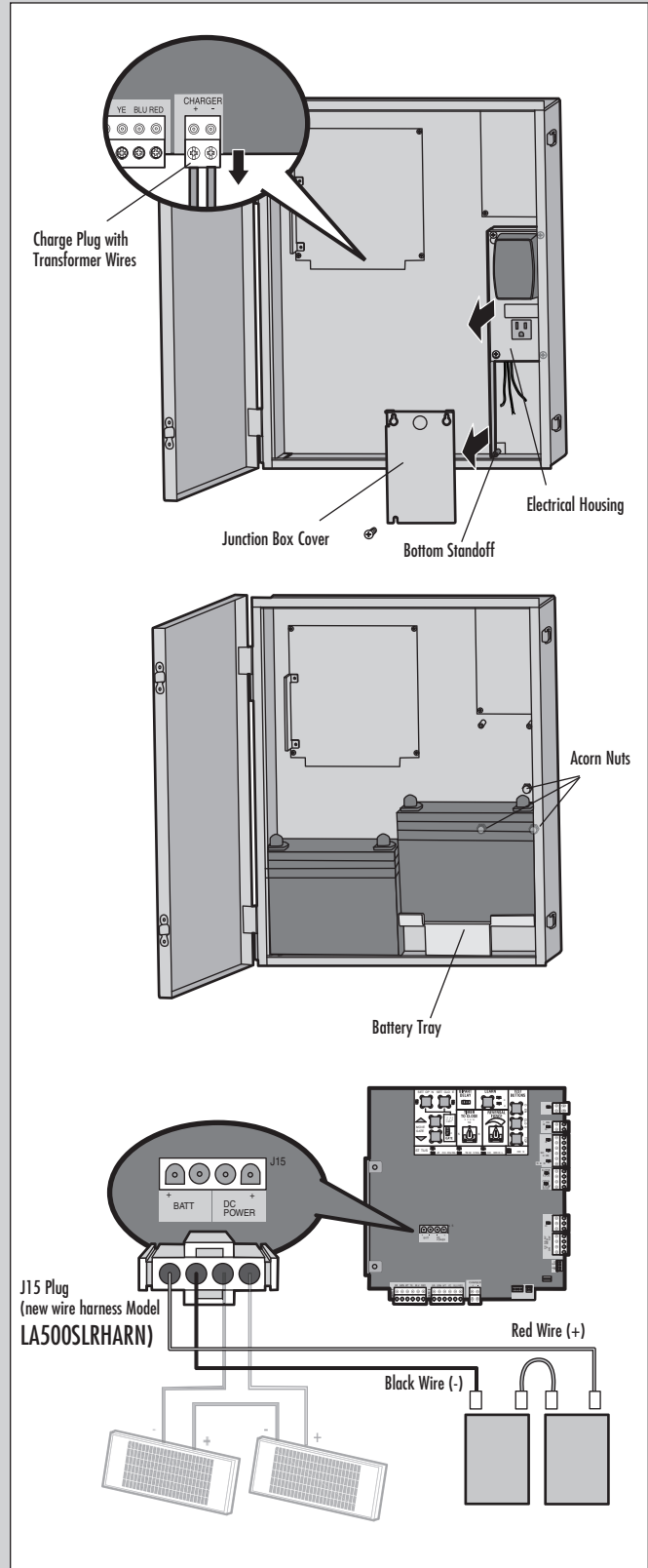
- 1 Connect the red wire (+) from one solar panel to the black wire (-) of the other solar panel.
- 2 Connect the shorter red wire (+) from the J15 plug (new wire harness) labeled DC Power to the red wire on one solar panel.
- 3 Connect the shorter black wire (-) from the J15 plug (new wire harness) labeled DC Power to the black wire from the other solar panel.



### POWER WIRING (SOLAR PANELS) CONTINUED...

#### CONNECT BATTERIES

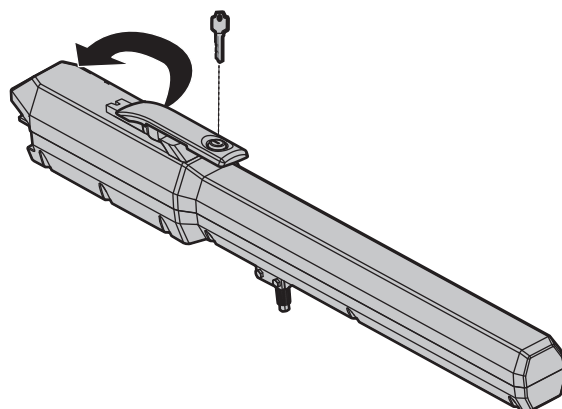
- 1 Locate the Charge plug on the control board and remove the transformer wires from the inputs.
- 2 Remove the electrical housing from the control box:
  - 1 Remove the wire ties from the electrical housing and remove the five screws securing the electrical housing to the control box.
  - 2 Remove the junction box cover and remove the bottom standoff.
  - 3 Shift the electrical housing to the side and remove the ground nut holding the ground wire in place.
- 3 Remove the two middle standoffs in the control box and cap the exposed screws with the provided acorn nuts.
- 4 Cap the exposed ground screw with the third acorn nut.
- 5 Place the battery tray in the bottom right corner of the control box. Ensure the wires are not pinched and routed to the side of the battery tray.
- 6 Place the batteries in the control box as shown.
- 7 Connect the longer red wire from the J15 plug (new solar wire harness) to the positive (+) terminal of one battery. Connect the longer black wire from the J15 plug (new wire harness) to the negative (-) terminal of the other battery.
- 8 Apply power by plugging the J15 plug (new solar wire harness) into the J15 input on the control board. **NOTE:** You may see a small spark when plugging the J15 plug into the board.



### ENGAGE THE OPERATOR

- 1 Turn the release lever clockwise 180°. This engages the motor.
- 2 Turn the key clockwise 180°. This locks the release lever.

The operator is now engaged.



### LIMIT AND FORCE ADJUSTMENT

#### ! WARNING

To reduce the risk of SEVERE INJURY or DEATH:

- Without a properly installed safety reversal system, persons (particularly small children) could be SERIOUSLY INJURED or KILLED by a moving gate.
- Too much force on gate will interfere with proper operation of safety reversal system.
- NEVER increase force beyond minimum amount required to move gate.
- NEVER use force adjustments to compensate for a binding or sticking gate.
- If one control (force or travel limits) is adjusted, the other control may also need adjustment.
- After ANY adjustments are made, the safety reversal system MUST be tested. Gate MUST reverse on contact with a rigid object.

#### INTRODUCTION

Your operator is designed with electronic controls to make travel limit and force adjustments easy. The adjustments allow you to program where the gate will stop in the open and close position. The electronic controls sense the amount of force required to open and close the gate. The force is adjusted automatically when you program the limits but should be fine tuned using the REVERSAL FORCE dial on the control board (refer to Fine Tune the Force section) to compensate for environmental changes.

The limits can be set using the control board (below) or a remote control (refer to Limit Setup with a Remote Control in the Additional Features section). Setting the limits with a remote control requires a 3-button remote control programmed to OPEN, CLOSE, and STOP.

**NOTE:** The Test Buttons on the control board will not work until the limits have been set.

LIMIT SETUP LEDS			
SET OPEN LED	SET CLOSE LED	OPERATOR MODE	EXPLANATION
BLINKING	BLINKING	NORMAL MODE	Limits are not set.
OFF	OFF	NORMAL MODE	Limits are set.
BLINKING	BLINKING	LIMIT SETTING MODE	Limits are not set.
BLINKING	ON	LIMIT SETTING MODE	Open limit is not set.
ON	BLINKING	LIMIT SETTING MODE	Close limit is not set.
ON	ON	LIMIT SETTING MODE	Limits are set.

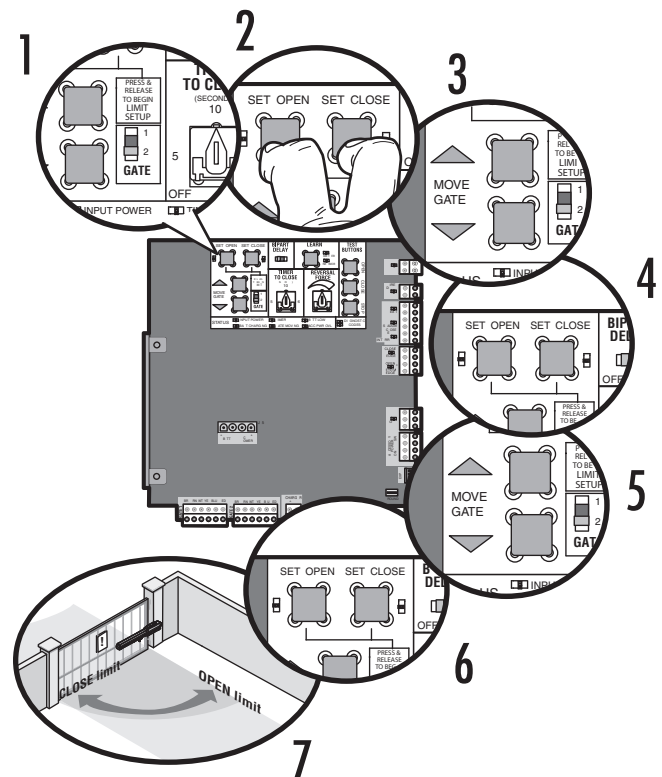
#### INITIAL LIMITS AND FORCE ADJUSTMENT

For dual gate applications the limits will have to be set for each operator. The gate **MUST** be attached to the operator before setting the limits and force.

- Set the GATE switch to the 1 position.
- Press and release the SET OPEN and SET CLOSE buttons simultaneously to enter limit setting mode.
- Press and hold the MOVE GATE buttons to move the gate to the open or close limit.
- Press and release the SET CLOSE or SET OPEN button depending on which limit is being set.
- Press and hold the MOVE GATE button to move the gate to the other limit.
- Press and release the SET CLOSE or SET OPEN button depending on which limit is being set. The operator will exit limit setting mode.\*
- Cycle the gate open and close using the TEST BUTTONS. This automatically sets the force.
- For dual gates set the Gate switch to the 2 position and repeat steps 2-7.

When limits are set properly the operator will automatically exit limit setting mode.

\* **Dual Gates ONLY:** When the limits are set on the secondary gate first the control board will not exit the limit setting mode until the limits are set on the primary gate.





# ADJUSTMENT

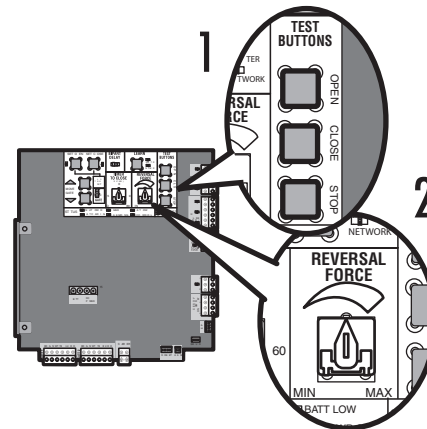
## LIMIT AND FORCE ADJUSTMENT + OBSTRUCTION TEST

### FINE TUNE THE FORCE

The FORCE DIAL on the control board is used for fine tuning the force in cases where wind or environmental changes may affect the gate travel.

Based on the length and weight of the gate it may be necessary to make additional force adjustments. The force setting should be high enough that the gate will not reverse by itself nor cause nuisance interruptions, but low enough to prevent serious injury to a person. The force setting is the same for both the open and close gate directions.

- 1 Open and close the gate with the TEST BUTTONS.
- 2 If the gate stops or reverses before reaching the fully open or closed position, increase the force by turning the force control slightly clockwise.
- 3 Perform the "Obstruction Test" after every force setting adjustment (see below).

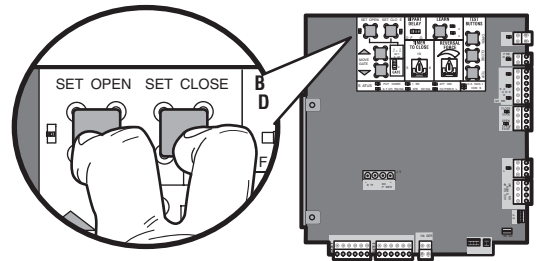


### ADJUST THE LIMITS

If the limits have already been set the operator will exit the limit setting mode after resetting each limit. Each limit is set separately by following steps 1-3 of the Initial Limit and Force Adjustment section, on page 27.

### ERASE LIMITS

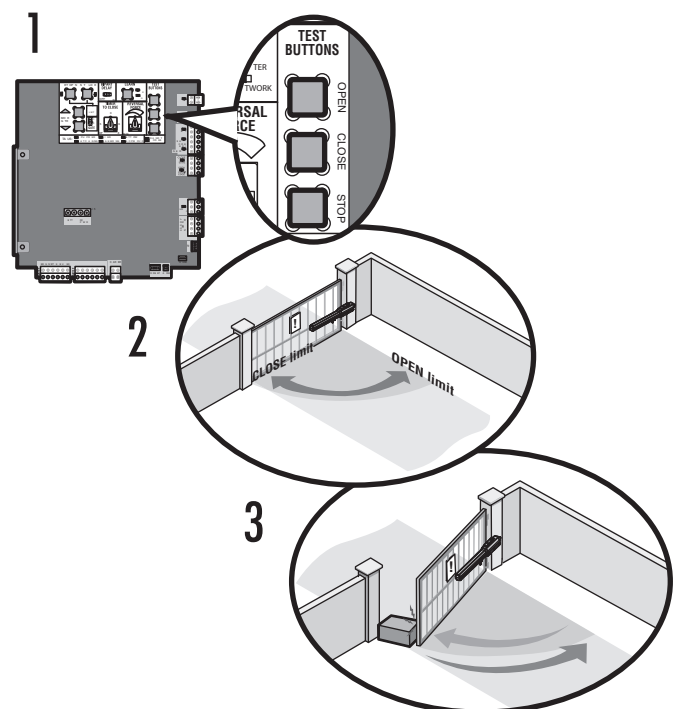
- 1 To erase the limits, press and hold the SET OPEN and SET CLOSE buttons simultaneously (5 seconds) until both the SET OPEN and SET CLOSE LEDs blink rapidly and the operator beeps.
- 2 Release the buttons and the SET OPEN and SET CLOSE LEDs will blink slowly indicating the limits will need to be set.



### OBSTRUCTION TEST

The operator is equipped with an automatic obstruction sensing feature. If the gate encounters an obstruction during motion, the operator will automatically reverse direction of the gate for a short time and then stop the gate. After any adjustments are made, test the operator:

- 1 Open and close the gate with the TEST BUTTONS, ensuring that the gate is stopping at the proper open and close limit positions.
- 2 Place a solid object between the open gate and a rigid structure. Ensure that the gate, the solid object, and the rigid structure can withstand the forces generated during this obstruction test.
- 3 Run the gate in the close direction. The gate should stop and reverse upon contact with the solid object. If the gate does not reverse off the solid object, reduce the force setting by turning the force control slightly counter-clockwise. The gate should have enough force to reach both the open and close limits, but MUST reverse after contact with a solid object.
- 4 Repeat the test for the open direction.



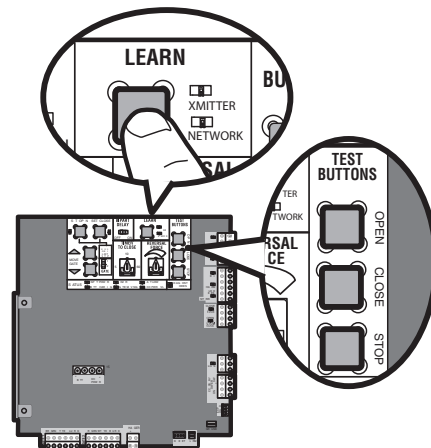
# PROGRAMMING

## REMOTE CONTROLS (NOT PROVIDED) + ERASE ALL CODES

### REMOTE CONTROLS (NOT PROVIDED)

A total of 50 Security+ 2.0™ remote controls and 2 keyless entries (1 PIN for each keyless entry) can be programmed to the operator. When programming a third keyless entry to the operator, the first keyless entry will be erased to allow the third keyless entry to be programmed. When the operator's memory is full it will exit the programming mode and the remote control will not be programmed. The memory will need to be erased before programming any additional remote controls. **NOTE:** If installing an 86LM to extend the range of the remote controls DO NOT bend the antenna.

There are 3 different options for programming the remote control depending on how you would like the remote control to function. Choose a programming option:

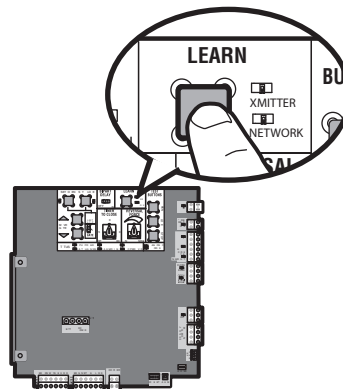


OPTION	DESCRIPTION	PROGRAMMING STEPS
Single button as OPEN only	Program a single button on the remote control for open only. The Timer-to-Close can be set to close the gate.	<ol style="list-style-type: none"> <li>1. Press and release the LEARN button (operator will beep and green XMITTER LED will light).</li> <li>2. Press the OPEN button.</li> <li>3. Press the remote control button that you would like to program.</li> </ol>
Single button (SBC) as OPEN, CLOSE, and STOP	Program one remote control button as an open, close, and stop.	<ol style="list-style-type: none"> <li>1. Press and release the LEARN button (operator will beep and green XMITTER LED will light).</li> <li>2. Press the remote control button that you would like to program.</li> </ol>
Three separate buttons as OPEN, CLOSE, and STOP	Program each remote control button as an open, close, and stop.	<ol style="list-style-type: none"> <li>1. Press and release the LEARN button (operator will beep and green XMITTER LED will light).</li> <li>2. Press the OPEN, CLOSE, or STOP button, depending on the desired function.</li> <li>3. Press the remote control button that you would like to program.</li> </ol>

The operator will automatically exit learn mode (operator will beep and green XMITTER LED will go out) if programming is successful. To program additional Security+ 2.0™ remote controls or remote control buttons, repeat the programming steps above.

### ERASE ALL CODES

- 1 Press and release the LEARN button (operator will beep and green XMITTER LED will light).
- 2 Press and hold the LEARN button again until the green XMITTER LED flashes and then release the button (approximately 6 seconds). All remote control codes are now erased.



NOTICE: To comply with FCC and/or Industry Canada (IC) rules, adjustment or modifications of this transceiver are prohibited. THERE ARE NO USER SERVICEABLE PARTS. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.  
This device complies with Part 15 of the FCC rules and IC RSS-210. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.  
This Class B digital apparatus complies with Canadian ICES-003.

AVIS : Les règles de la FCC et/ou d'Industrie Canada (IC) interdisent tout ajustement ou toute modification de ce récepteur. IL N'EXISTE AUCUNE PIÈCE SUSCEPTIBLE D'ÊTRE ENTRETENU PAR L'UTILISATEUR. Tout changement ou toute modification non expressément approuvé par la partie responsable de la conformité peut avoir pour résultat d'annuler l'autorité de l'utilisateur de faire fonctionner l'équipement. Cet appareil est conforme aux dispositions de la partie 15 du règlement de la FCC et de la norme IC RSS-210. Son utilisation est assujettie aux deux conditions suivantes : (1) ce dispositif ne peut causer des interférences nuisibles, et (2) ce dispositif doit accepter toute interférence reçue, y compris une interférence pouvant causer un fonctionnement non souhaité.  
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

# OPERATION

MANUAL RELEASE + RESET BUTTON + PARTY MODE + OPERATOR ALARM +  
REMOTE CONTROL

## MANUAL RELEASE

In case of a power failure, the operator can be disengaged from the gate. With an operator, the release action may sometimes feel stiff/jerky, which is normal and has no effect on function. **NOTE:** It is normal for the operator to run slow right after a disconnect or complete loss of AC/battery power (the operator will need to run a complete open and close cycle).

### RELEASE

- 1 Insert the key into the lock.
- 2 Turn the key counter-clockwise 180°.
- 3 Turn the release lever counter-clockwise 180°.

Operator is in manual mode and the gate can be opened and closed manually.

### ENGAGE

- 1 Turn the release lever clockwise 180°. This engages the motor.
- 2 Turn the key clockwise 180°. This locks the release lever.
- 3 Remove the key and store in a safe place. The operator is now engaged.

## RESET BUTTON

The reset button is located on the side of the control box and serves several functions. Pressing the reset button will stop a moving gate during a normal open/close cycle, like a stop button. The operator does not need to be reset after doing this.

### PROGRAMMING LIMITS RESET

If a mistake is made while programming the limits press the reset button to start over.

## PARTY MODE

Press the reset button once while the gate is in open position to disable the Timer-to-Close. The gate will stay in the open position. To restart the Timer-to-Close either press the reset button or activate the gate with a programmed remote control.

## OPERATOR ALARM

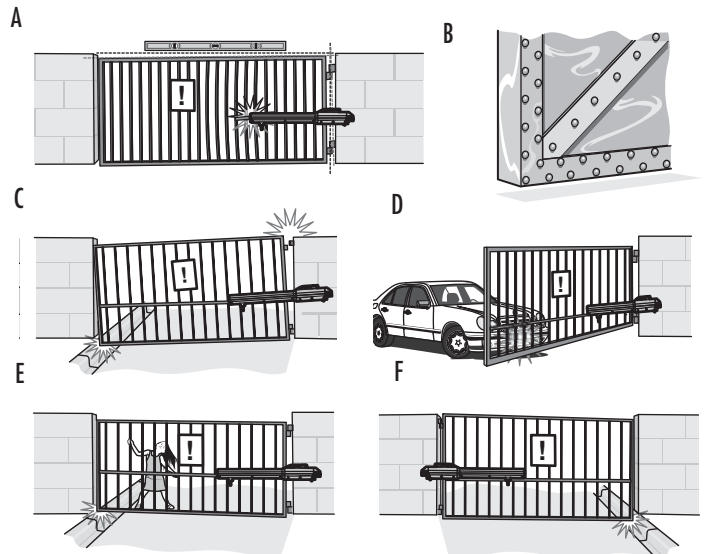
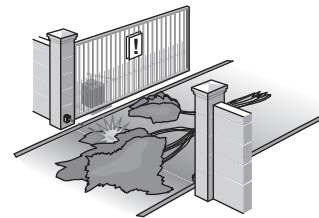
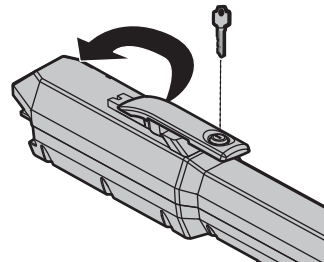
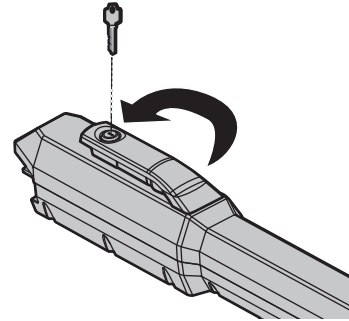
If a contact sensor detects an obstruction twice consecutively the alarm will sound (up to 5 minutes) and the operator will need to be reset.

When the inherent force of the operator (RPM/current sensor) detects the following (twice consecutively) the alarm will sound (up to 5 minutes) and the operator will need to be reset:

- A. The operator arm or gate is incorrectly installed.
- B. The gate does not meet specifications.
- C. Gate hinges are too tight or broken and the gate is not moving freely.
- D. The gate is moving and a car pushes the gate.
- E. A foreign object is on the gate frame while the gate is moving.
- F. The gate hits the driveway, curb or other, and gets stuck or bent in an awkward position.

Remove any obstructions. Press the reset button to shut off the alarm and reset the operator. After the operator is reset, normal functions will resume.

The operator alarm will beep 3 times with a command if the battery is low.



## REMOTE CONTROL

### SINGLE BUTTON CONTROL (SBC) FUNCTIONALITY

Once the remote control has been programmed the operator will operate as follows:

When gate is in the closed position, activation of the remote control button will open the gate. During the open cycle another activation of the remote control will stop the gate and the next activation of the remote control will close the gate.

When the gate is in the open position, activation of the remote control button will close the gate. If the remote control is activated while the gate is closing, the gate will stop and the next activation will open the gate.

# ADDITIONAL FEATURES

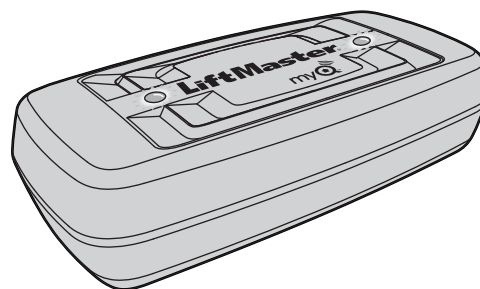
## LIFTMASTER INTERNET GATEWAY

### LIFTMASTER INTERNET GATEWAY

To program the operator to the LiftMaster Internet Gateway:

#### USING THE LEARN BUTTON ON THE OPERATOR'S CONTROL BOARD

- 1 Connect the ethernet cable to the LiftMaster Internet Gateway and the router.
- 2 Connect power to the LiftMaster Internet Gateway.
- 3 Create an online account by visiting [www.myliftmaster.com](http://www.myliftmaster.com).
- 4 Register the LiftMaster Internet Gateway.
- 5 Use an internet enabled computer or smartphone to add devices. The LiftMaster Internet Gateway will stay in learn mode for three minutes.
- 6 Press the Learn button twice on the primary operator (the operator will beep as it enters learn mode). The LiftMaster Internet Gateway will pair to the operator if it is within range and the operator will beep if programming is successful.



#### OR

#### USING THE RESET BUTTON ON THE OPERATOR

- 1 Connect the ethernet cable to the LiftMaster Internet Gateway and the router.
- 2 Connect power to the LiftMaster Internet Gateway.
- 3 Create an online account by visiting [www.myliftmaster.com](http://www.myliftmaster.com).
- 4 Register the LiftMaster Internet Gateway.
- 5 Use an internet enabled computer or smartphone to add devices. The LiftMaster Internet Gateway will stay in learn mode for three minutes.
- 6 Ensure gate is closed.
- 7 Give the operator an OPEN command.
- 8 Within 30 seconds, when the gate is at the open limit press and release the reset button 3 times (on primary gate) to put primary operator into High Band Learn Mode (the operator will beep as it enters learn mode). The LiftMaster Internet Gateway will pair to the operator if it is within range and the operator will beep if programming is successful.

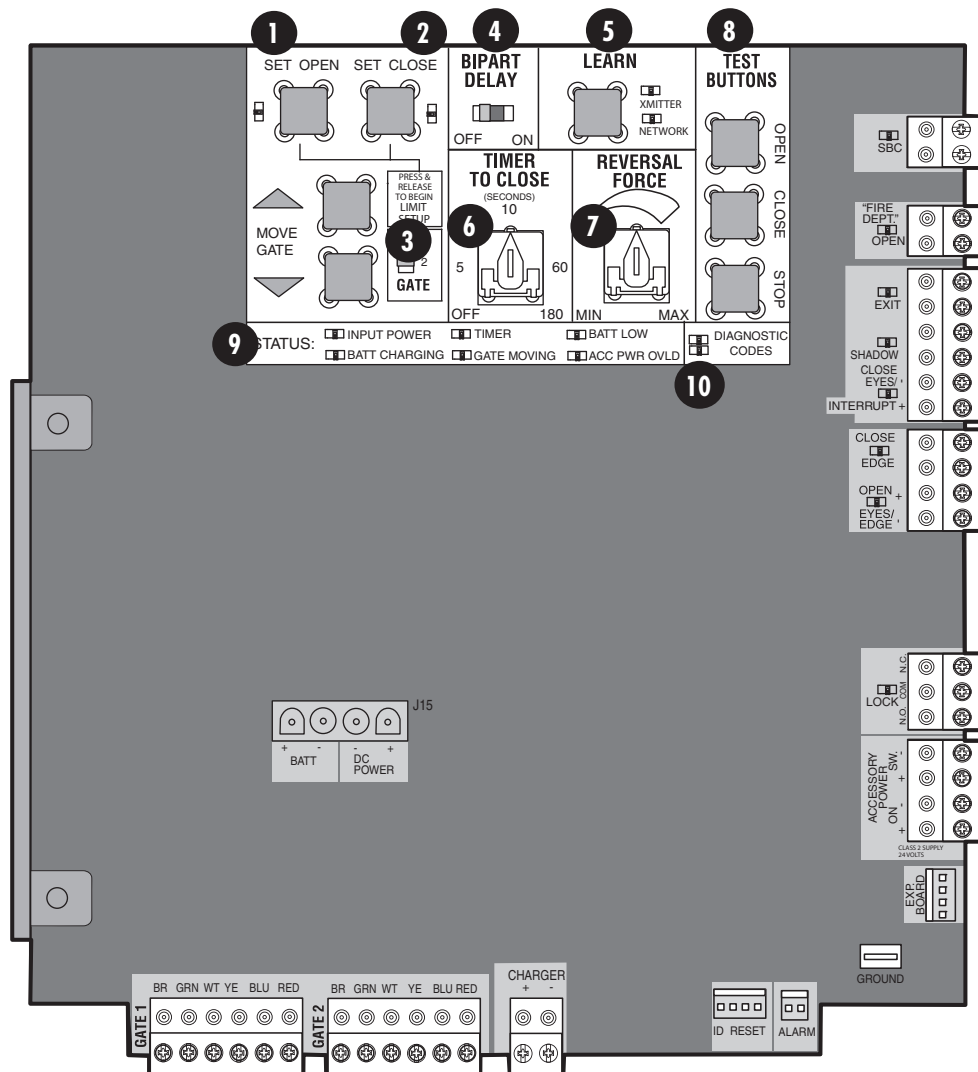
The status as shown by the LiftMaster Internet Gateway app will be either "open" or "closed". The gate operator can then be controlled through the LiftMaster Internet Gateway app.

# ADDITIONAL FEATURES

## CONTROL BOARD OVERVIEW

### CONTROL BOARD OVERVIEW

- 1 **SET OPEN Button:** The SET OPEN button sets the OPEN limit. See Adjust Limits section.
- 2 **SET CLOSE Button:** The SET CLOSE button sets the CLOSE limit. See Adjust Limits section.
- 3 **MOVE GATE Buttons:** The MOVE GATE buttons will either open or close the gate when the operator is in Limit setting mode. See Adjust Limits section.
- 4 **BIPART DELAY Switch:** The LOCK/BIPART DELAY switch is used only for dual gates. See Bipart Delay section.
- 5 **LEARN Button:** The LEARN button is for programming remote controls and the network.
- 6 **TIMER-TO-CLOSE dial:** The TIMER-TO-CLOSE (TTC) dial can be set to automatically close the gate after a specified time period. The TTC is factory set to OFF. If the TTC is set to the OFF position, then the gate will remain open until the operator receives another command from a control. Rotate the TIMER-TO-CLOSE dial to the desired setting. The range is 0 to 180 seconds, 0 seconds is OFF.  
**NOTE:** Any radio command, single button control, or CLOSE command on the control board prior to the TTC expiring will close the gate. The TTC is reset by any signals from the open controls, loops, close edges, and close photoelectric sensors (IR's).
- 7 **REVERSAL FORCE dial:** The REVERSAL FORCE dial adjusts the force. See Force Adjustment section.
- 8 **TEST BUTTONS:** The TEST BUTTONS will operate the gate (OPEN, STOP and CLOSE).
- 9 **STATUS LEDs:** The STATUS LEDs are diagnostic codes for the operator. See Status LED Chart in the Troubleshooting section.
- 10 **Firmware Version:** To check the firmware version for the main board:
  1. Locate the yellow diagnostic LED on the main control board.
  2. Disconnect AC/DC power to the main control board for 15 seconds.
  3. Connect power. The yellow diagnostic LED will flash rapidly, then stop, then flash the version number, then stop, then flash the revision number (for example: For version 5.1 the LED will flash rapidly, stop, flash 5 times, stop, then flash once).



# ADDITIONAL FEATURES

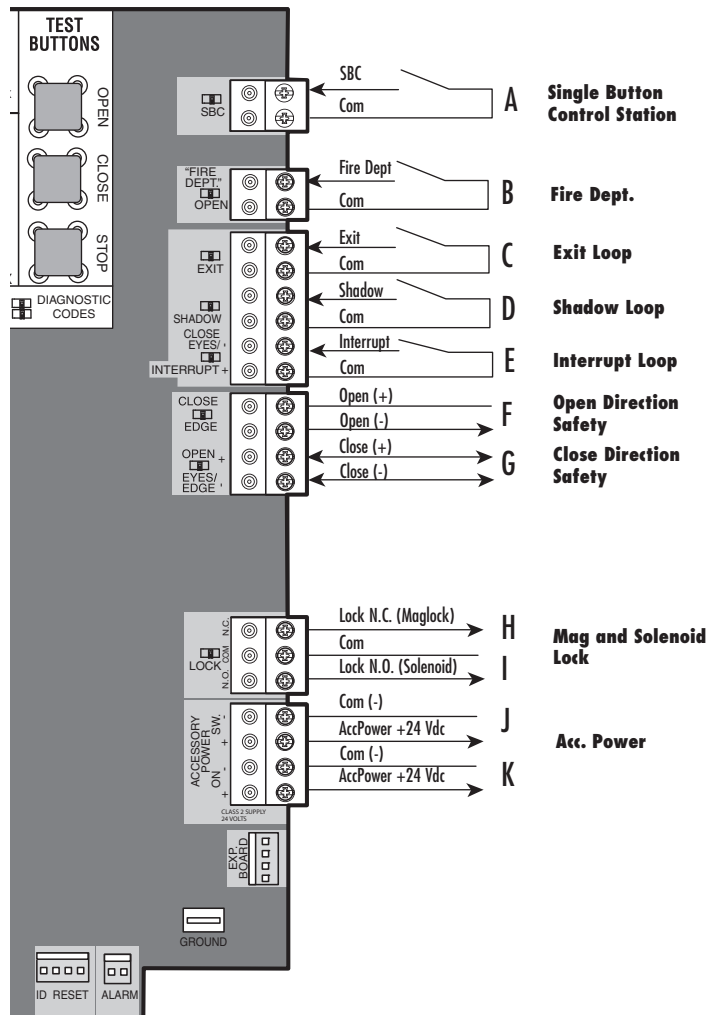
## WIRING ACCESSORIES TO THE CONTROL BOARD

### WIRING ACCESSORIES TO THE CONTROL BOARD

Refer to the chart below and the corresponding image for a description of the control board inputs.

<b>A</b>	<b>Single Button Control, SBC (2 terminals)</b>	Gate command sequence - Open, Stop, Close, Stop, ... Soft open (maintained switch does not override external safeties and does not reset alarm condition)
<b>B</b>	<b>Fire Dept Open Input (2 terminals)</b>	Acts as hard open. Maintained input overrides (ignores) external safeties (photoelectric sensor and edge), pauses Timer-to-Close momentary input logic as single button control and safeties remain active, re-enables Timer-to-Close.
<b>C</b>	<b>Exit Loop Input (2 terminals)</b>	Open command - opens a closed gate. Soft open (maintained switch does not override external safeties and does not reset alarm condition) If maintained, pauses Timer-to-Close at OPEN limit. Opens a closing gate and holds open an open gate.
<b>D</b>	<b>Shadow Loop Input (2 terminals)</b>	Loop detector connection when loop is positioned under gate. - Holds open gate at open limit - Disregarded during gate motion - Pauses Timer-to-Close at OPEN limit
<b>E</b>	<b>CLOSE EYES/Interrupt Loop Input (2 terminals)</b>	CLOSE EYES/Interrupt Loop detector connection when loop is along the side of the gate. - Holds open gate at open limit - Stops and reverses a closing gate to open limit - Pauses Timer-to-Close at OPEN limit  Close Direction Photoelectric Sensors, IR, or Infra-red detector wired to CLOSE EYES Input, disregarded during gate opening. Pulsed Photoelectric Sensors = monitored device putting out a pulse train when unblocked. Photoelectric Sensors, IR, Infra-red detector, normally open contact, contact opens fully with obstruction.
<b>F</b>	<b>Close Edge (2 terminals)</b>	Close Direction Edge Sensor to Close Safety Input, disregarded during gate opening
<b>G</b>	<b>Open Eyes/Edge (2 terminals)</b>	Open Direction Photoelectric Sensors, IR, Infra-red detector wired or Edge Sensor to Close Entrapments Input, disregarded during gate closing,  Pulsed Photoelectric Sensors = monitored device putting out a pulse train when unblocked. Photoelectric Sensors, IR, Infra-red detector, edge sensor = normally open contact, contact reverses for 2 seconds with obstruction.
<b>H</b>	<b>Lock Outputs: Maglock (2 terminals, N.C. and COM)</b>	Relay contact output, Normally - closed (N.C.) output for maglocks Relay activates prior to motor activation and during motor run. Relay is off when motor is off.
<b>I</b>	<b>Solenoid Lock &amp; Common (2 terminals, N.O. and COM)</b>	Normally - open (N.O.) output for solenoid locks Relay activates prior to motor activation and during motor run. Relay is off when motor is off.
<b>J</b>	<b>Accessory Power Out Switched, (2 terminals)</b>	Switched ON with gate motion (stays on 5 seconds after motion)
<b>K</b>	<b>Accessory Power Out Un-switched, (2 terminals)</b>	24 Vdc voltage out to power accessories, always ON

(right side of control board)





# ADDITIONAL FEATURES

## EXPANSION BOARD OVERVIEW

### 1 QUICK CLOSE Switch:

OFF: No change to the gate's normal operation.

ON: When CLOSE EYES/Interrupt loop is deactivated it causes an opening or a stopped gate to close (ignores the Timer-to-Close).

### 2 AC FAIL OPEN/BATT Switch:

OPEN: Loss of AC power will cause the gate to open approximately 15 seconds after AC power fail and remain OPEN until AC power is restored (enabling the Timer-to-Close).

BATT: With loss of AC power, gate will remain in present position and operator is powered from batteries.

### 3 LOW BATT/EXIT LOOP FAIL Switch:

- When AC power is OFF and battery voltage is low the gate will latch at a limit until AC power is restored or batteries voltage increases.
- Option select switch set to OPEN forces gate to latch at the OPEN limit if it is at the OPEN limit or on next open command until AC power is restored or battery voltage increases.
- Option select switch set to CLOSE forces gate to latch at CLOSE limit if at CLOSE limit or on next CLOSE command until AC power restored or battery voltage increases.
- Constant pressure on a hard command input overrides to open or close the gate.
- Low battery detect point = 22 V
- When set to OPEN, if the EXIT plug-in loop detector detects a fault, then the gate will open and remain open until fault is cleared. When set to CLOSE, then plug-in EXIT loop detector faults are ignored (EXIT loop is faulted and inoperative).

### 4 ANTI-TAIL OPEN/CLOSE SELECTION switch:

OFF: When CLOSE EYES/Interrupt loop is activated it causes a closing gate to stop and reverse.

ON: When CLOSE EYES/Interrupt loop is activated it causes a closing gate to pause. Once the vehicle is clear the gate will continue to close.

### 5 AUX RELAY switches: Set the AUX RELAY switches as needed to obtain the desired function as shown in the table below.

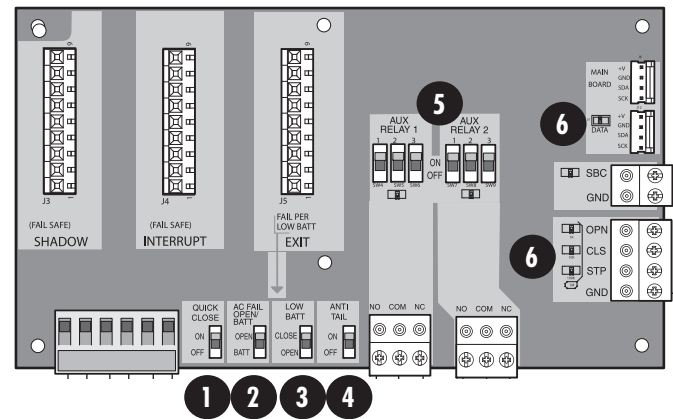
## EXPANSION BOARD OVERVIEW

### CAUTION

To AVOID damaging the circuit board, relays or accessories, DO NOT connect more than 42 Vdc (32 Vac) to the AUX relay contact terminal blocks.

### 6 Firmware Version: To check the firmware version for the expansion board:

- Locate the OPEN, CLOSE, STOP, and DATA LEDs on the expansion board.
- Disconnect AC/DC power to the main control board for 15 seconds.
- Connect power. The OPEN, CLOSE, and STOP LEDs will flash in sequence until the main control board firmware revision is displayed. When the green DATA LED glows solid the OPEN LED will flash the version number, then stop, then the CLOSE LED will flash the revision number (for example: For version 5.1 when the green DATA LED is solid the OPEN LED will flash 5 times, then stop, then the CLOSE LED will flash once).



AUX RELAY SETTING	SWITCH SETTINGS			AUX RELAY 1	AUX RELAY 2
	1	2	3		
Off (no feature selected)	OFF	OFF	OFF	Relay always off. Use this Aux Relay setting to conserve battery power.	
Open Limit Switch	OFF	OFF	ON	Energizes at open limit. Use with SAMS (Sequenced Access Management System, jointly with barrier gate)	
Close Limit Switch	OFF	ON	OFF	Energizes when not at close limit. For an additional audible or visual display, connect an external light (low voltage).	
Gate Motion	OFF	ON	ON	Energizes when motor is on (gate in motion). For an additional audible or visual display, connect an external buzzer or light (low voltage).	
Pre-Motion Delay	ON	OFF	OFF	Energizes 3 seconds before gate motion and remains energized during gate motion. The onboard alarm will sound. For an additional audible or visual display, connect an external buzzer or light (low voltage).	Energizes 3 seconds before gate motion and remains energized during gate motion. For an additional audible or visual display, connect an external buzzer or light (low voltage).
Power	ON	ON	OFF	Energizes when AC power or solar power is present. There is approximately a 10-12 second delay before relay cutoff, after AC shutdown.	Energizes when on battery power. There is approximately a 10-12 second delay before relay cutoff, after AC shutdown.
Tamper	ON	OFF	ON	Energizes if gate is manually tampered with by being pushed off of close limit. For an additional audible or visual display, connect an external buzzer or light (low voltage).	Energizes if gate is manually tampered with by being pushed off of close limit. For an additional audible or visual display, connect an external buzzer or light (low voltage).
Cycle Quantity Feedback*	ON	ON	ON	The OPEN, CLOSE, and STOP LEDs will blink out the cycle count (cycle count is stored on the control board). See below.	Not used.

## CYCLE COUNT

\* First, note the current Aux Relay switch positions. To determine the actual cycles that the gate operator has run (in thousands), set all three Aux Relay switches to the ON setting for Aux Relay 1. The Expansion Board's OPEN, CLOSE, and STOP LEDs will blink out the cycle count, with OPEN LED blinking 1000's, CLOSE LED blink 10,000's, STOP LED blinking 100,000's, and simultaneously all three LED's blink 1,000,000's (e.g. Open blinks 3 times, Close blinks 6 times, and Stop blinks once. Cycle count is 163,000.). Cycle count displayed is between 1,000 and 9,999,000 cycles. After servicing, set Aux Relay switches back to their appropriate positions. Cycle count cannot be reset or changed. If under 1,000 cycles the Open, Close, and Stop LEDs will turn on for 10 seconds, then turn off.

**NOTE:** The expansion board will flash the cycle count 3 times then all the LEDs will turn on solid for 10 seconds then turn off.



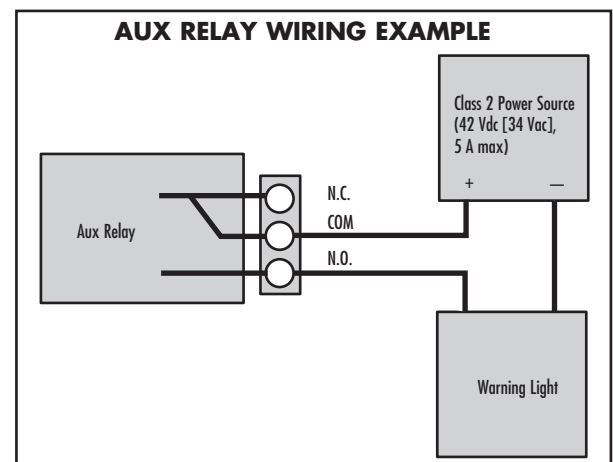
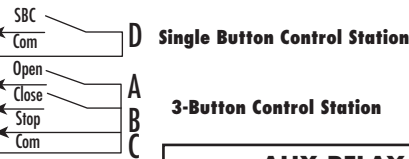
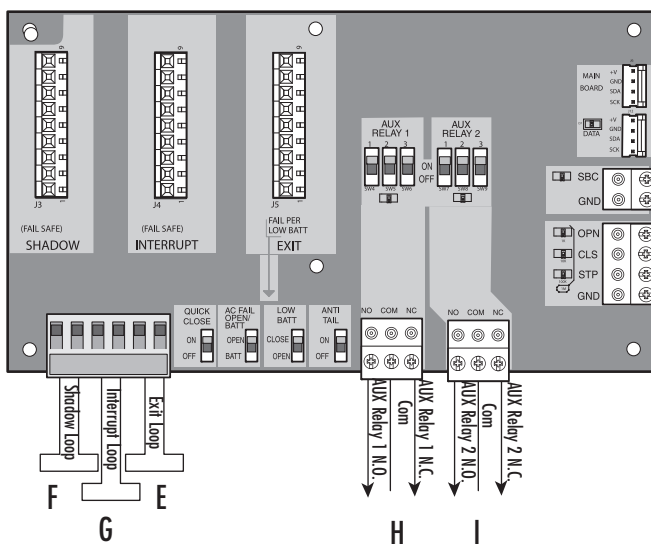
# ADDITIONAL FEATURES

## WIRING ACCESSORIES TO THE EXPANSION BOARD

### WIRING ACCESSORIES TO THE EXPANSION BOARD

Refer to the chart below and the corresponding image for a description of the expansion board inputs.

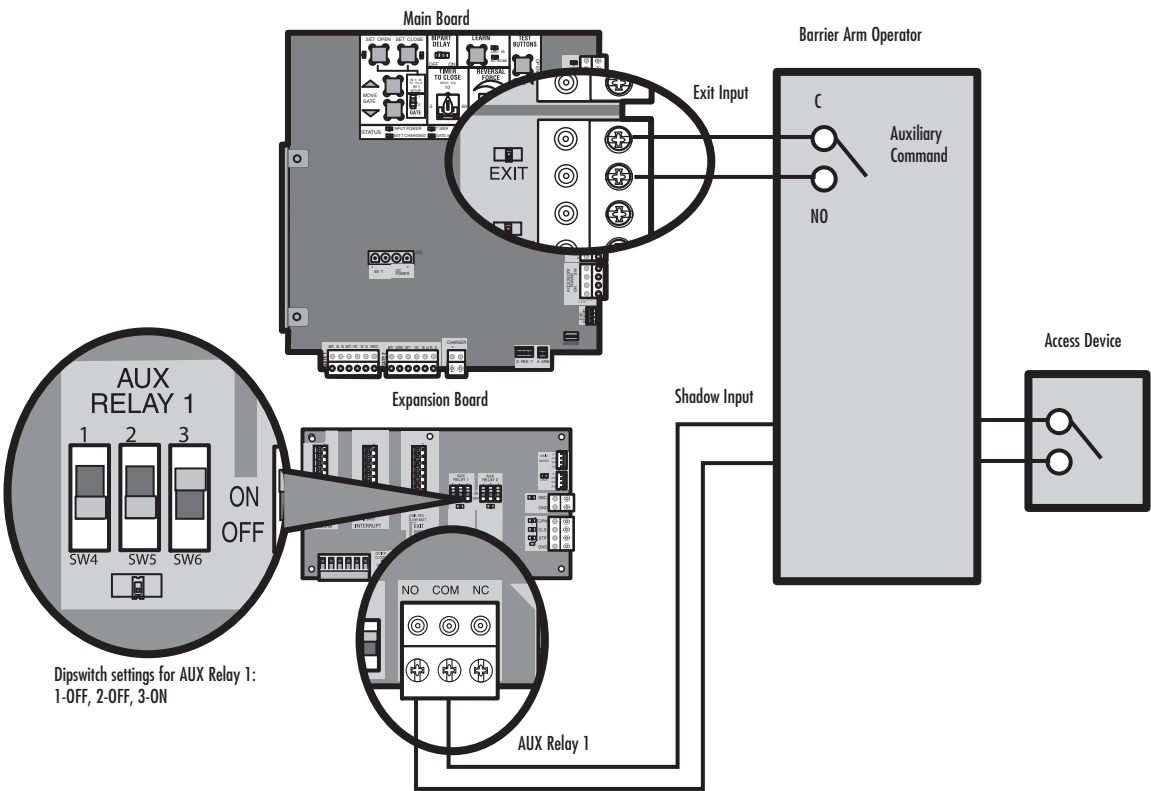
<b>A</b>	<b>Open Input (&amp; common)</b> (3-Button Control Station, 4 terminals total)	Open command - opens a closed gate. Soft open (maintained switch does not override external safeties and does not reset alarm condition) If maintained, pauses Timer-to-Close at OPEN limit. Opens a closing gate and holds open an open gate.
<b>B</b>	<b>Close Input (&amp; common)</b> (3-Button Control Station, 4 terminals total)	Close command - closes an open gate. Soft close (maintained switch does not override external safeties and does not reset alarm condition)
<b>C</b>	<b>Stop Input (&amp; common)</b> (3-PB station, 4 terminals total)	Stop command - stops a moving gate. Hard stop (maintained switch overrides Open and Close commands and resets alarm condition) If maintained, pauses Timer-to-Close at OPEN limit. Overrides an Open or Close command.
<b>D</b>	<b>Single Button Control, SBC (2 terminals)</b>	Gate command sequence - Open, Stop, Close, Stop, ... Soft Open ,Soft Close, Soft Stop (maintained switch does not override external safeties and does not reset alarm condition)
<b>E</b>	<b>Exit Loop Input (2 terminals)</b>	Loop wire connection for plug-in loop detector when loop is inside secured area near gate. Open command - opens a closed gate. Soft open (maintained switch does not override external safeties and does not reset alarm condition) If maintained, pauses Timer-to-Close at OPEN limit. Opens a closing gate and holds open an open gate.
<b>F</b>	<b>Shadow Loop Input (2 terminals)</b>	Loop wire connection for plug-in loop detector when loop is positioned under the gate. - Holds open gate at open limit - Disregarded during gate motion - Pauses Timer-to-Close at Open Limit
<b>G</b>	<b>Interrupt Loop Input (2 terminals)</b>	Loop wire connection for plug-in loop detector when loop is along the side of the gate. - Holds open gate at open limit - Stops and reverses a closing gate - Pauses Timer-to-Close at Open Limit
<b>H</b>	<b>AUX Relay #1</b>	Normally - open and normally - closed relay contacts to control external devices, Function of relay contact activation determined by AUX Relay #1 option switch settings. (For connection of Class 2, low voltage (42 Vdc [34 Vac] max 5 Amps, power sources only)
<b>I</b>	<b>AUX Relay #2</b>	Normally-open and normally-closed relay contacts to control external devices, Function of relay contact activation determined by AUX Relay #2 option switch settings. (For connection of Class 2, low voltage (42 Vdc [34 Vac] max 5 Amps, power sources only)



# ADDITIONAL FEATURES

SAMS WIRING WITH RELAYS NOT ENERGIZED

## SAMS WIRING WITH RELAYS NOT ENERGIZED



# ADDITIONAL FEATURES

## GATE OPERATOR SETUP EXAMPLES

### GATE OPERATOR SETUP EXAMPLES

The following are example setups for the gate operator. Your specific site requirements may be different. Always setup the operator system to the site requirements, including all necessary secondary entrapment protection systems.

**RESIDENTIAL SMALL:** One to four residential homes sharing a gated entrance/exit, allowing vehicle access trumps security concerns

**RESIDENTIAL LARGE:** A residential community (more than four homes) having one or more gated entrances/exits, allowing vehicle access trumps security concerns

**COMMERCIAL:** Business site where security (gate closed) is important

**INDUSTRIAL:** Large business site where security is required

Setting	RESIDENTIAL SMALL	RESIDENTIAL LARGE	COMMERCIAL	INDUSTRIAL
<b>Quick Close switch setting</b>	Normally set to OFF. Normal gate close (timer or control).	Normally set to OFF. Normal gate close (timer or control).	Normally set to OFF. Normal gate close (timer or control).	Set to ON, so that gate closes immediately after vehicle passes interrupt loop.
<b>AC Fail Open switch setting</b>	Normally set to BATT. Run on battery if AC power fails.	Normally set to BATT. For local jurisdiction requirement, set to OPEN so that the gate will open approximately 15 seconds after AC power fail.	Normally set to BATT. Run on battery if AC power fails.	Normally set to BATT. Run on battery if AC power fails.
<b>Low Battery switch setting</b>	Normally set to OPEN. If powered from battery and battery is low, gate stays open.	Normally set to OPEN. If powered from battery and battery is low, gate stays open.	Normally set to CLOSE. If powered from battery and battery is low, gate stays close.	Normally set to CLOSE. If powered from battery and battery is low, gate stays close.
<b>Anti-Tail switch setting</b>	Normally set to OFF. Interrupt loop reverses a closing gate.	Normally set to OFF. Interrupt loop reverses a closing gate.	Set to ON. In attempt to prevent vehicle tail-gating, interrupt loop pauses a closing gate.	Set to ON. In attempt to prevent vehicle tail-gating, interrupt loop pauses a closing gate.
<b>Bipart Delay switch setting</b>	For DUAL-GATE site, set to ON for gate that delays upon opening	For DUAL-GATE site, set to ON for gate that delays upon opening	For DUAL-GATE site, set to ON for gate that delays upon opening	For DUAL-GATE site, set to ON for gate that delays upon opening
<b>Aux Relay Out – Open Limit Switch</b>	Typically not required.	Use with SAMS (Sequence Access Management System)	1) Use with SAMS (Sequence Access Management System) 2) Connect "Gate Open" indicator (e.g. light)	1) Use with SAMS (Sequence Access Management System) 2) Connect "Gate Open" indicator (e.g. light)
<b>Aux Relay Out – Close Limit Switch</b>	Typically not required.	Typically not required.	Connect "Gate Close/Secure" indicator (e.g. light)	Connect "Gate Close/Secure" indicator (e.g. light)
<b>Aux Relay Out – Gate Motion</b>	Attach alert signal (audible or visual alert system)	Attach alert signal (audible or visual alert system)	Attach alert signal (audible or visual alert system)	Attach alert signal (audible or visual alert system)
<b>Aux Relay Out – Pre-Motion Delay</b>	Attach alert signal (audible or visual alert system)	Attach alert signal (audible or visual alert system)	Attach alert signal (audible or visual alert system)	Attach alert signal (audible or visual alert system)
<b>Aux Relay Out – Power</b>	Attach visual alert to know when system is charging batteries (i.e. not running on batteries)	Attach visual alert to know when system is charging batteries (i.e. not running on batteries)	Attach visual alert to know when system is charging batteries (i.e. not running on batteries)	Attach visual alert to know when system is charging batteries (i.e. not running on batteries)
<b>Aux Relay Out – Tamper</b>	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit
<b>Cycle Quantity Feedback</b>	Use during servicing only to determine operator cycles	Use during servicing only to determine operator cycles	Use during servicing only to determine operator cycles	Use during servicing only to determine operator cycles
<b>Fire Dept Open input</b>	Typically not required.	Connect emergency access system (Knox box switch, SOS system, etc.)	Typically not required.	Typically not required.

# ADDITIONAL FEATURES

## LIMIT SETUP WITH A REMOTE CONTROL

### LIMIT SETUP WITH A REMOTE CONTROL

To set the limits using a remote control, first you will need a 3-button remote control that has been programmed for OPEN, CLOSE, and STOP. Refer to the Programming section.

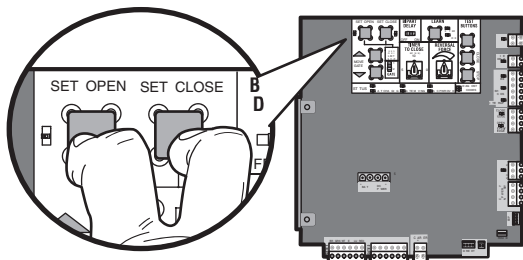
#### INITIAL LIMITS AND FORCE ADJUSTMENT

For dual gate applications the limits will have to be set for each operator. The gate **MUST** be attached to the operator before setting the limits and force.

Ensure the gate is closed.

- 1 Press and release the SET OPEN and SET CLOSE buttons simultaneously to enter limit setting mode.
- 2 Press and hold the OPEN or CLOSE button on the remote control until the gate reaches the desired open position. The gate can be jogged back and forth using the OPEN and CLOSE buttons on the remote control.
- 3 Once the gate is in the desired open position, press and release the STOP button on the remote control.
- 4 Press and release the OPEN button on the remote control again to set the open limit.
- 5 Press and hold the CLOSE or OPEN button on the remote control until the gate reaches the desired close position. The gate can be jogged back and forth using the OPEN and CLOSE buttons on the remote control.
- 6 Once the gate is in the desired close position, press and release the STOP button on the remote control.
- 7 Press and release the CLOSE button on the remote control again to set the close limit.
- 8 Cycle the gate open and close. This automatically sets the force.

When limits are set properly the operator will automatically exit limit setting mode.



#### ADJUST THE LIMITS

If the limits have already been set the operator will exit the limit setting mode after resetting each limit.

##### Set the Close Limit Only

- 1 Press and release the SET OPEN and SET CLOSE buttons simultaneously to enter limit setting mode.
- 2 Press and hold the CLOSE button on the remote control until the gate reaches the desired close position. The gate can be jogged back and forth using the OPEN and CLOSE buttons on the remote control.
- 3 Once the gate is in the desired close position, press and release the STOP button on the remote control.
- 4 Press and release the CLOSE button on the remote control again to set the close limit.

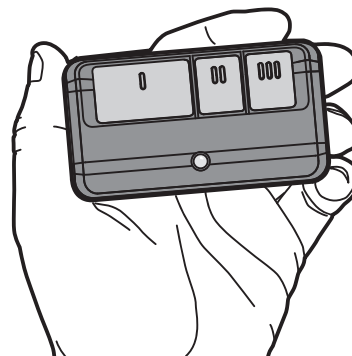
When the close limit is set properly the operator will automatically exit limit setting mode.

##### Set the Open Limit Only

- 1 Press and release the SET OPEN and SET CLOSE buttons simultaneously to enter limit setting mode.
- 2 Press and hold the OPEN button on the remote control until the gate reaches the desired open position. The gate can be jogged back and forth using the OPEN and CLOSE buttons on the remote control.
- 3 Once the gate is in the desired open position, press and release the STOP button on the remote control.
- 4 Press and release the OPEN button on the remote control again to set the open limit.

When the open limit is set properly the operator will automatically exit limit setting mode.

3-Button Remote Control programmed for OPEN, CLOSE, and STOP



# MAINTENANCE

## MAINTENANCE CHART + BATTERIES

### MAINTENANCE CHART

**Disconnect all power (AC, solar, battery) to the operator before servicing.** The operator's AC Power switch ONLY turns off AC power to the control board and DOES NOT turn off battery power. ALWAYS disconnect the batteries to service the operator.

DESCRIPTION	TASK	CHECK AT LEAST ONCE EVERY		
		MONTH	6 MONTHS	3 YEARS
Entrapment Protection Devices	Check and test for proper operation	X		
Warning Signs	Make sure they are present	X		
Manual Release	Check and test for proper operation		X	
Gate	Inspect for wear or damage	X		
Accessories	Check all for proper operation		X	
Electrical	Inspect all wire connections		X	
Mounting Hardware	Check for tightness		X	
Operator	Inspect for wear or damage		X	
Batteries	Replace			X

#### NOTES:

- Severe or high cycle usage will require more frequent maintenance checks.
- It is suggested that while at the site voltage readings be taken at the operator. Using a digital voltmeter, verify that the incoming voltage to the operator is within ten percent of the operator's rating.

### BATTERIES

Batteries will degrade over time depending on temperature and usage. The operator alarm will beep 3 times with a command if the battery is low. Batteries do not perform well in extremely cold temperatures. For best performance, the batteries should be replaced every 3 years. Use only LiftMaster part 29-NP712 for replacement batteries. The standard control box comes with two 7AH batteries.

Two 33AH (A12330SGLPK) may be used in place of the 7AH batteries for a Large Metal Control Box solar installation. A battery tray (model K10-36183) and battery harness (model LA500SLRHARN) are required for 33AH applications.

The batteries contain lead and need to be disposed of properly.

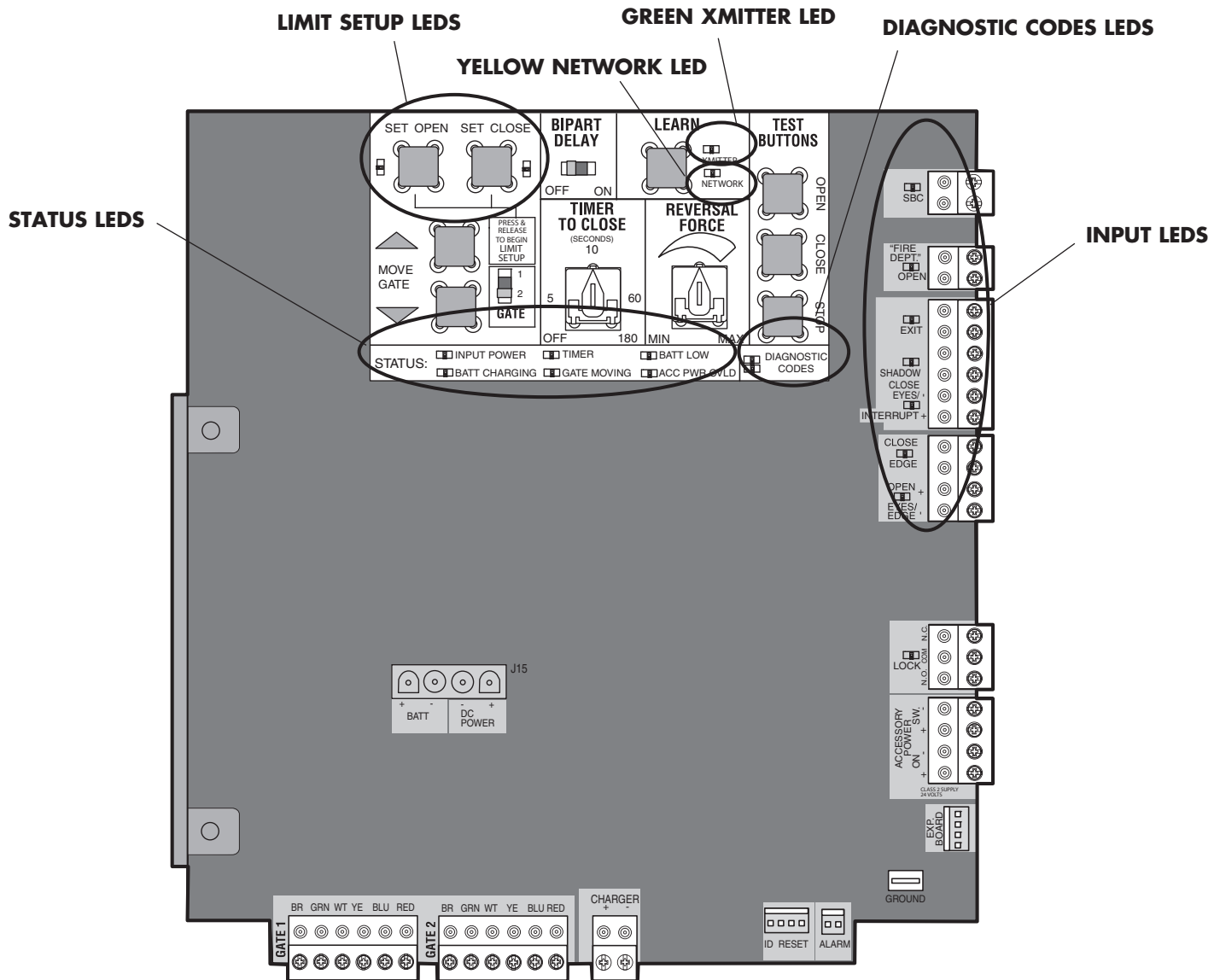
# TROUBLESHOOTING

## CONTROL BOARD LEDS

### CONTROL BOARD LEDS

The control board is equipped with many LEDs that have a variety of functions. The control board LEDs indicate the status of the operator, assist with programming, and diagnose potential problems with the operator.

**NOTE:** When cycling or disconnecting power (ac/dc) to the control board, it is recommended that you unplug the J15 and Solar/Charger plug.



LIMIT SETUP LEDS			
SET OPEN LED	SET CLOSE LED	OPERATOR MODE	EXPLANATION
BLINKING	BLINKING	NORMAL MODE	Limits are not set.
OFF	OFF	NORMAL MODE	Limits are set.
BLINKING	BLINKING	LIMIT SETTING MODE	Limits are not set.
BLINKING	ON	LIMIT SETTING MODE	Open limit is not set.
ON	BLINKING	LIMIT SETTING MODE	Close limit is not set.
ON	ON	LIMIT SETTING MODE	Limits are set.

GREEN XMITTER LED	
XMITTER LED	EXPLANATION
OFF	No remote control activity, normal operation.
ON	Programming mode active.
ON (for 1 second)	Recognized remote control signal.
ON (for a 1/4 of a second)	Unrecognized remote control signal.
ON (8 blinks per second)	Remote controls are being erased.

# TROUBLESHOOTING

## CONTROL BOARD LEDS CONTINUED...

## CONTROL BOARD LEDS

### DIAGNOSTIC CODES LEDS

YELLOW DIAGNOSTIC LED		
# BLINKS	MEANING	CORRECTION
2 BLINKS	ID resistor failure	Check ID resistor wiring, clear limit settings and reset limits
3 BLINKS	Exceeded Maximum Run Timer	Check gate travel, if necessary adjust force setting
4 BLINKS	Gate 1 disengaged	Verify the release handle is engaged and locked
5 BLINKS	Gate 1 RPM (obstruction)	Check for obstruction, if necessary adjust force setting
6 BLINKS	Gate 1 current (obstruction)	Check for obstruction, if necessary adjust force setting
7 BLINKS	Gate 1 position failure	Check gate travel, clear limit settings and reset limits
8 BLINKS	Gate 2 disengaged	Verify the release handle is engaged and locked
9 BLINKS	Gate 2 RPM (obstruction)	Check for obstruction, if necessary adjust force setting
10 BLINKS	Gate 2 current (obstruction)	Check for obstruction, if necessary adjust force setting
11 BLINKS	Gate 2 position failure	Check gate travel, clear limit settings and reset limits
12 BLINKS	Loop Error	One of the loops is in error. Refer to the loop detector to determine the error.

INPUT LEDS		
OPEN INPUT	OFF	Input inactive
	ON	Input active
	BLINK	Input active on other operator
CLOSE INPUT	OFF	Input inactive
	ON	Input active
	BLINK	Input active on other operator
STOP INPUT	OFF	Input inactive
	ON	Input active
	BLINK	Input active on other operator
FIRE DEPT INPUT	OFF	Input inactive
	ON	Input active
	BLINK	Input active on other operator
SBC INPUT	OFF	Input inactive
	ON	Input active
	BLINK	Input active on other operator
OPEN SAFETY INPUT	OFF	Input inactive
	ON	Input active
	BLINK	Input active on other operator
CLOSE SAFETY INPUT	OFF	Input inactive
	ON	Input active
	BLINK	Input active on other operator

RED DIAGNOSTIC LED		
BEFORE replacing the control board cycle the power first. If the problem persists, then proceed with the appropriate correction.		
# BLINKS	MEANING	CORRECTION
2 BLINKS	Current Sense	Motor control circuit fault, replace control board
3 BLINKS	FET Failure	Motor control circuit fault, replace control board
4 BLINKS	RAM Failure	Memory failure, replace control board
5 BLINKS	Flash Memory Failure	Memory failure, replace control board
6 BLINKS	EEPROM Failure	Memory failure, replace control board
7 BLINKS	Watchdog Failure	Controller failure, replace control board
8 BLINKS	Brownout*	Check power harness or line voltage
9 BLINKS	Fail	Control Board failure
10-15 BLINKS	Software Failure	Cycle power to the control board. If continues replace control board.

\* NOTE: After a brownout there is some delay before the system comes up. During this delay the Amber LED will flash rapidly.

STATUS LEDS		
INPUT POWER	OFF	OFF state
	ON	AC charger or Solar power available
BATT CHARGING	OFF	Not charging
	ON	Trickle charge
	FAST BLINK (2 blinks per second)	High current charge
	SLOW BLINK (1 blink every 2 seconds)	Medium charge
TIMER	OFF	The timer is disabled
	ON	The timer is enabled
	MEDIUM BLINK (1 blink per second)	The timer is running
	FAST BLINK (2 blinks per second)	The timer is paused
	FASTEST BLINK (8 blinks per second)	The timer is cancelled
GATE MOVING	OFF	The gate is stopped
	ON	The gate is opening or closing
	MEDIUM BLINK (1 blink per second)	Operator is in E1 (single entrapment)
	FASTEST BLINK (8 blinks per second)	The operator is in E2 (double entrapment)
BATT LOW	OFF	No battery error
	ON	Battery low
	MEDIUM BLINK (1 blink per second)	Battery critically low
	FAST BLINK (2 blinks per second)	Battery disconnected error (seen in solar application or using plug in transformer motion is inhibited)
	FASTEST BLINK (8 blinks per second)	Battery over voltage/over current error
ACC PWR OVLD	OFF	OFF state
	ON	Accessory overload protector opened



# TROUBLESHOOTING

## TROUBLESHOOTING CHART

### TROUBLESHOOTING CHART

FAULT	POSSIBLE CAUSES	CORRECTIONS
<b>Operator does not run and diagnostic LED not on.</b>	<ul style="list-style-type: none"> <li>a) No power to control board</li> <li>b) Open fuse</li> <li>c) If on battery power only, low or dead batteries</li> <li>d) Defective control board</li> </ul>	<ul style="list-style-type: none"> <li>a) Check AC and battery power</li> <li>b) Check fuses</li> <li>c) Charge batteries by AC or solar power or replace batteries</li> <li>d) Replace defective control board</li> </ul>
<b>Control board powers up, but motor does not run.</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Reset button is stuck</li> <li>c) Stop button active</li> <li>d) If on battery power only, low or dead batteries</li> <li>e) Open or Close input active</li> <li>f) Entrapment Protection Device active</li> <li>g) Vehicle loop detector or probe active</li> <li>h) Defective control board</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Check Reset button</li> <li>c) Check Stop button is not "stuck on"</li> <li>d) Charges batteries by AC or solar power or replace batteries</li> <li>e) Check all Open and Close inputs for a "stuck on" input</li> <li>f) Check all Entrapment Protection Device inputs for a "stuck on" sensor</li> <li>g) Check all vehicle detector inputs for a "stuck on" detector</li> <li>h) Replace defective control board</li> </ul>
<b>Relay clicks with command, but motor does not turn on.</b>	<ul style="list-style-type: none"> <li>a) Arm jammed or not connected</li> <li>b) Defective motor or motor wires</li> <li>c) Defective control board</li> </ul>	<ul style="list-style-type: none"> <li>a) Disengage the arm and ensure arm moves freely</li> <li>b) Inspect motor wires for open wire, shorted wires, damage, etc. Else, replace arm.</li> <li>c) Replace defective control board.</li> </ul>
<b>Arm moves, but cannot set correct limits.</b>	<ul style="list-style-type: none"> <li>a) Arm does not extend or retract enough during travel</li> <li>b) Arm is interfering with mounting bracket</li> <li>c) Gate is too difficult to move</li> </ul>	<ul style="list-style-type: none"> <li>a) Disengage the arm and ensure arm moves freely</li> <li>b) Examine the hinge point where the arm mounts to the gate post. Make sure that the arm housing does not hit or interfere with the gate post or mounting bracket. Correct as necessary.</li> <li>c) Disconnect arm from gate and move gate manually. Gate must move easily and freely through its entire range, limit-to-limit. Repair gate as needed.</li> </ul>
<b>Gate does not fully open or fully close when setting limits.</b>	<ul style="list-style-type: none"> <li>a) Arm does not extend or retract enough during travel</li> <li>b) Arm is interfering with mounting bracket</li> <li>c) Gate is too difficult to move</li> </ul>	<ul style="list-style-type: none"> <li>a) Disengage the arm and ensure arm moves freely</li> <li>b) Examine the hinge point where the arm mounts to the gate post. Make sure that the arm housing does not hit or interfere with the gate post or mounting bracket. Correct as necessary.</li> <li>c) Remove arm from gate and move gate manually. Gate must move easily and freely through its entire range, limit-to-limit. Repair gate as needed.</li> </ul>
<b>Operator does not respond to a wired control/command (example: Open, Close, SBC, etc.)</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Check Open and Close command input LEDs</li> <li>c) Stop button is active</li> <li>d) Reset button is stuck</li> <li>e) If on battery power only, low or dead batteries</li> <li>f) Entrapment Protection Device active</li> <li>g) Vehicle loop detector or vehicle probe active</li> <li>h) Defective control board</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Check all Open and Close inputs for a "stuck on" input</li> <li>c) Check Stop button is not "stuck on"</li> <li>d) Check Reset button</li> <li>e) Charges batteries by AC or solar power or replace batteries</li> <li>f) Check all Entrapment Protection Device inputs for a "stuck on" sensor</li> <li>g) Check all vehicle detector inputs for a "stuck on" detector</li> <li>h) Replace defective control board</li> </ul>
<b>Operator does not respond to a wireless control or transmitter</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Check XMITTER LED when wireless control is active</li> <li>c) Stop button is active</li> <li>d) Reset button is stuck</li> <li>e) Poor radio reception</li> <li>f) Defective control board</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Activate wireless control and check XMITTER LED is on. Re-learn wireless control/transmitter to control board. Replace wireless control as needed.</li> <li>c) Check Stop button is not "stuck on"</li> <li>d) Check Reset button</li> <li>e) Check if similar wired control operates correctly. Check if wireless controls works properly when within a few feet of operator. Check operator's antenna and antenna wire. Check other wireless controls or devices.</li> <li>f) Replace defective control board</li> </ul>
<b>Gate stops during travel and reverses immediately.</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Inherent force obstruction detection</li> <li>c) External Entrapment Protection Device activation</li> <li>d) Control (Open, Close) becoming active</li> <li>e) Vehicle loop detector active</li> <li>f) Low battery voltage</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Check for obstruction in gate's path or travel. Remove arm from gate and move gate manually. Gate must move easily and freely through its entire range, limit-to-limit. Remove obstruction or repair gate as needed.</li> <li>c) Check all Entrapment Protection Device inputs for an active sensor</li> <li>d) Check all Open and Close inputs for an active input</li> <li>e) Check all vehicle detector inputs for an active detector</li> <li>f) Battery voltage must be 22.0 Vdc or higher. Charge batteries by AC or solar power or replace batteries</li> </ul>



# TROUBLESHOOTING

## TROUBLESHOOTING CHART

FAULT	POSSIBLE CAUSES	CORRECTIONS
<b>Gate opens, but will not close.</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Open control active</li> <li>c) Close Entrapment Protection Device active</li> <li>d) Vehicle loop detector active</li> <li>e) Loss of AC power with AC FAIL set to OPEN</li> <li>f) Low battery with LOW BATT set to OPEN</li> <li>g) Fire Dept input active</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Check all Open inputs for an active input</li> <li>c) Check all Entrapment Protection Device inputs for an active sensor</li> <li>d) Check all vehicle detector inputs for an active detector</li> <li>e) Check AC power and AC Fail option setting</li> <li>f) Battery voltage must be 22.0 Vdc or higher. Charge batteries by AC or solar power or replace batteries</li> <li>g) Check Fire Dept input</li> </ul>
<b>Gate closes, but will not open.</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Open Entrapment Protection Device active</li> <li>c) Vehicle loop detector active</li> <li>d) Low battery with LOW BATT switch set to close</li> <li>e) Low battery with LOW BATT option set to CLOSE</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Check all Entrapment Protection Device inputs for an active sensor</li> <li>c) Check all vehicle detector inputs for an active detector</li> <li>d) Battery voltage must be 22.0 Vdc or higher</li> <li>e) Check if AC power is available. If no AC power, then running on batteries and battery voltage must be 22.0 Vdc or higher. Charge batteries by AC or solar power or replace batteries</li> </ul>
<b>Gate does not close from Timer-to-Close.</b>	<ul style="list-style-type: none"> <li>a) Timer-to-Close not set</li> <li>b) Open control active</li> <li>c) Close Entrapment Protection Device active</li> <li>d) Vehicle loop detector active</li> <li>e) Loss of AC power with AC FAIL set to OPEN</li> <li>f) Low battery with LOW BATT option set to OPEN</li> <li>g) Fire Dept input active</li> </ul>	<ul style="list-style-type: none"> <li>a) Check Timer-to-Close (TTC) setting</li> <li>b) Check all Open inputs for an active input</li> <li>c) Check all Entrapment Protection Device inputs for an active sensor</li> <li>d) Check all vehicle detector inputs for an active detector</li> <li>e) Check AC power and AC Fail option setting</li> <li>f) Check if AC power is available. If no AC power, then running on batteries and battery voltage must be 22.0 Vdc or higher. Charge batteries by AC or solar power or replace batteries.</li> <li>g) Check Fire Dept input</li> </ul>
<b>Vehicle Exit loop activation does not cause gate to open.</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Exit vehicle detector setup incorrectly</li> <li>c) Defective Exit loop detector or loop wire</li> <li>d) Low battery with LOW BATT option set to CLOSE</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Review Exit loop detector settings. Adjust settings as needed.</li> <li>c) Check Exit loop wire. Replace defective Exit loop detector.</li> <li>d) Check if AC power is available. If no AC power, then running on batteries and battery voltage must be 22.0 Vdc or higher. Charge batteries by AC or solar power or replace batteries.</li> </ul>
<b>Vehicle Interrupt loop does not cause gate to stop and reverse.</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Vehicle detector setup incorrectly</li> <li>c) Defective vehicle loop detector or loop wire</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Review Interrupt loop detector settings. Adjust settings as needed</li> <li>c) Check Interrupt loop wire. Replace defective Interrupt loop detector</li> </ul>
<b>Vehicle Shadow loop does not keep gate at open limit.</b>	<ul style="list-style-type: none"> <li>a) Check DIAGNOSTIC LEDs</li> <li>b) Vehicle detector setup incorrectly</li> <li>c) Defective vehicle loop detector or loop wire</li> </ul>	<ul style="list-style-type: none"> <li>a) Use Diagnostic code to identify issue</li> <li>b) Review Shadow loop detector settings. Adjust settings as needed</li> <li>c) Check Shadow loop wire. Replace defective Shadow loop detector</li> </ul>
<b>Obstruction in gates path does not cause gate to stop and reverse</b>	<ul style="list-style-type: none"> <li>a) Force setting too high</li> </ul>	<ul style="list-style-type: none"> <li>a) Adjust force setting. Retest that obstruction in gate's path causes gate to stop and reverse direction.</li> </ul>
<b>Photoelectric sensor does not stop or reverse gate.</b>	<ul style="list-style-type: none"> <li>a) Incorrect photoelectric sensor wiring</li> <li>b) Defective photoelectric sensor</li> </ul>	<ul style="list-style-type: none"> <li>a) Check photoelectric sensor wiring. Retest that obstructing photoelectric sensor causes moving gate to stop, and may reverse direction.</li> <li>b) Replace defective photoelectric sensor. Retest that obstructing photoelectric sensor causes moving gate to stop, and may reverse direction.</li> </ul>
<b>Edge Sensor does not stop or reverse gate.</b>	<ul style="list-style-type: none"> <li>a) Incorrect edge sensor wiring</li> <li>b) Defective edge sensor</li> </ul>	<ul style="list-style-type: none"> <li>a) Check edge sensor wiring. Retest that activating edge sensor causes moving gate to stop and reverse direction.</li> <li>b) Replace defective edge sensor. Retest that activating edge sensor causes moving gate to stop and reverse direction.</li> </ul>

# TROUBLESHOOTING

## TROUBLESHOOTING CHART

FAULT	POSSIBLE CAUSES	CORRECTIONS
Alarm sounds for 5 minutes or alarm sounds with a command.	a) Double entrapment occurred	a) Check for cause of entrapment (obstruction) detection and correct. Press the reset button to shut off alarm and reset the operator.
Alarm beeps three times with a command.	a) Low battery	a) Check if AC power is available. If no AC power, then running on batteries and battery voltage must be 22.0 Vdc or higher. Charge batteries by AC or solar power or replace batteries
On dual-gate system, one gate is not commanding the other.	a) Defective or incorrect Operator-to-Operator wiring b) Incorrect Operator-to-Operator wireless learning	a) Check operator-to-operator wiring. b) Relearn the wireless network of one operator to the other operator.
On dual-gate system, incorrect gate opens first or closes first.	a) Incorrect Bipart switch setting	a) Change setting of both operator's Bipart switch settings. One operator should have Bipart switch ON (operator that opens second) and the other operator should have Bipart switch OFF (operator that opens first)
<b>Alarm beeps when running.</b>		
Expansion board function not controlling gate.	a) Defective main board to expansion board wiring b) Incorrect input wiring to expansion board c) Defective expansion board or defective main board	a) Check main board to expansion board wiring. If required, replace wire cable. b) Check wiring to all inputs on expansion board. c) Replace defective expansion board or defective main board
Maglock not working correctly.	a) Maglock wired incorrectly	a) Check that Maglock is wired to N.C. and COM terminals. Check that Maglock has power (do not power maglock from control board accessory power terminals). If shorting lock's NO and COM wires does not activate Maglock, then replace Maglock or Maglock wiring
Solenoid lock not working correctly.	a) Solenoid wired incorrectly	a) Check that Solenoid is wired to N.O. and COM terminals. Check that Solenoid has power (do not power solenoid from control board accessory power terminals). If shorting lock's NC and COM wires does not activate Solenoid, then replace Solenoid lock or Solenoid wiring
Switched (SW) Accessory power remaining on.	a) In limit setup mode	a) Learn the limits
Accessories connected to Switch (SW) Accessory power not working correctly, turning off, or resetting.	a) Normal behavior	a) Move accessory to accessory power "ON"
Accessories connected to Accessory power not working correctly, turning off, or resetting.	a) Accessory power protector active b) Defective control board	a) Disconnect all accessory powered devices and measure accessory power voltage (should be 23 – 30 Vdc). If voltage is correct, connect accessories one at a time, measuring accessory voltage after every new connection. b) Replace defective control board
Quick Close not working correctly.	a) Quick Close setting incorrect b) Interrupt loop detector or loop wire defective c) Defective Expansion board	a) Check that Quick Close setting is ON b) Check operation of Interrupt Loop detector c) Replace defective Expansion board
Anti-Tailgating not working correctly.	a) Anti-Tail setting incorrect b) Interrupt loop detector or loop wire defective c) Defective Expansion board	a) Check that Anti-Tail setting is ON b) Check operation of Interrupt Loop detector c) Replace defective Expansion board
AUX Relay not working correctly.	a) AUX Relay setting incorrect b) AUX Relay wiring incorrect c) Defective Expansion board	a) Check AUX Relay switches settings b) Check that wiring is connected to either N.O. and COM or to N.C. and COM. c) Set AUX Relay to another setting and test. Replace defective expansion board.

# REPAIR PARTS

## STANDARD CONTROL BOX

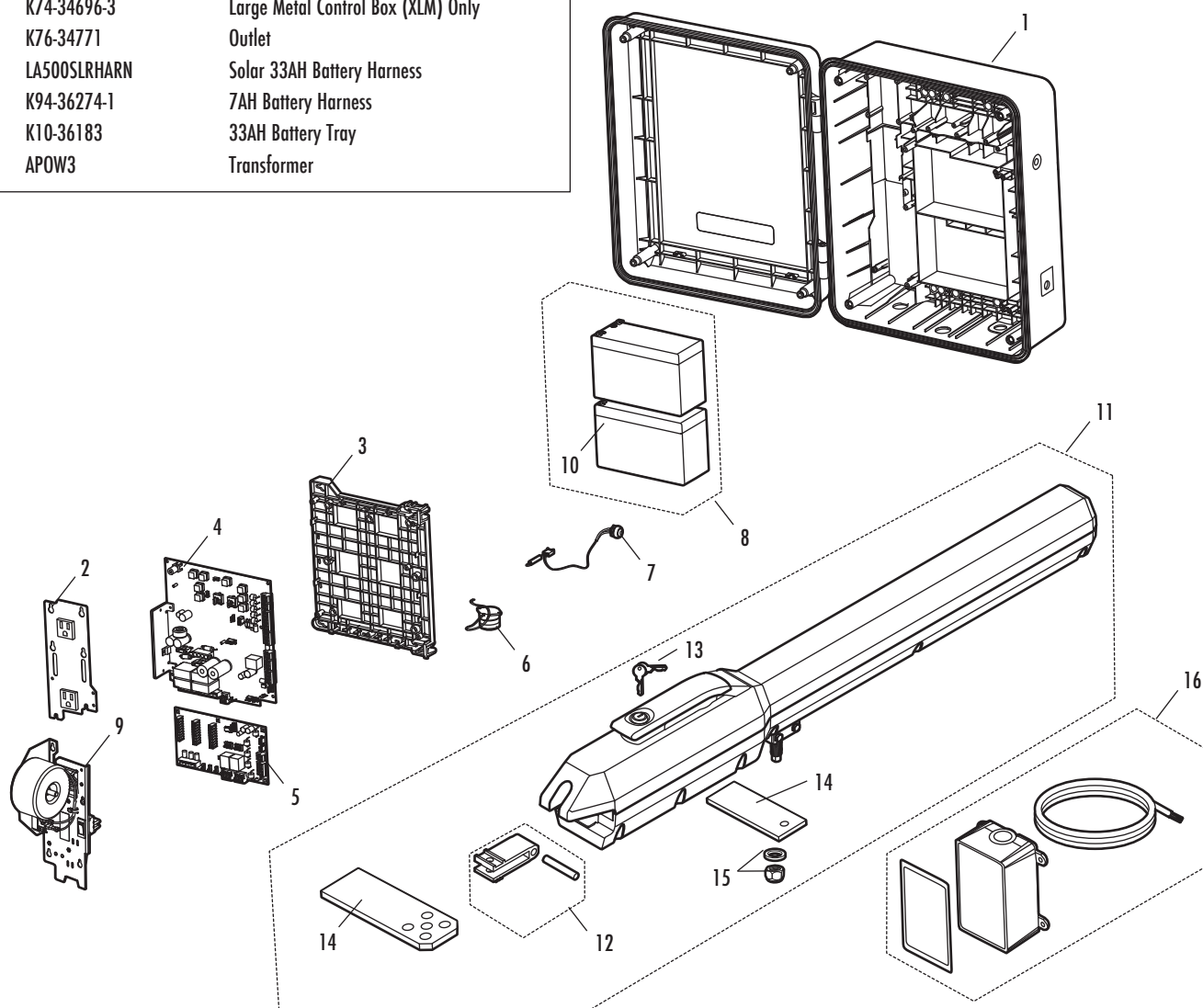
ITEM	PART NUMBER	DESCRIPTION
1	K74-34582-1	Standard Plastic Control Box Only
2	K76-36296-1	Outlet
3	K75-36635	Control Board Bracket
4	K1D7545CC	Control Board Assembly
5	K1D6686CC	Expansion Board
6	K94-36411	Piezo Alarm
7	K94-36408-1	Reset Switch with ID Resistor
8	K74-36596	Batteries (2) with jumper
9	LA500HDTKITSTD	Toroidal Transformer
10	29-NP712	Single Battery
<b>NOT SHOWN</b>		
	K77-36541	Antenna

## LARGE METAL CONTROL BOX (XLM)

<b>NOT SHOWN</b>		
	K74-34696-3	Large Metal Control Box (XLM) Only
	K76-34771	Outlet
	LA500SLRHARN	Solar 33AH Battery Harness
	K94-36274-1	7AH Battery Harness
	K10-36183	33AH Battery Tray
	APOW3	Transformer

## GATE OPERATOR ARM

ITEM	PART NUMBER	DESCRIPTION
11	LA500	Primary Arm
12	KSWG-0623	Rear Connector with Pin
13	41ASWG-0119	Release Keys
14	Q230	Steel Bracket Mounting Plates
15	Q232	Bottom Washer and Nut
16	K94-36591	Junction Box with Cable
<b>NOT SHOWN</b>		
	K77-36389	Hardware Bag



# WIRING DIAGRAMS

## STANDARD CONTROL BOX

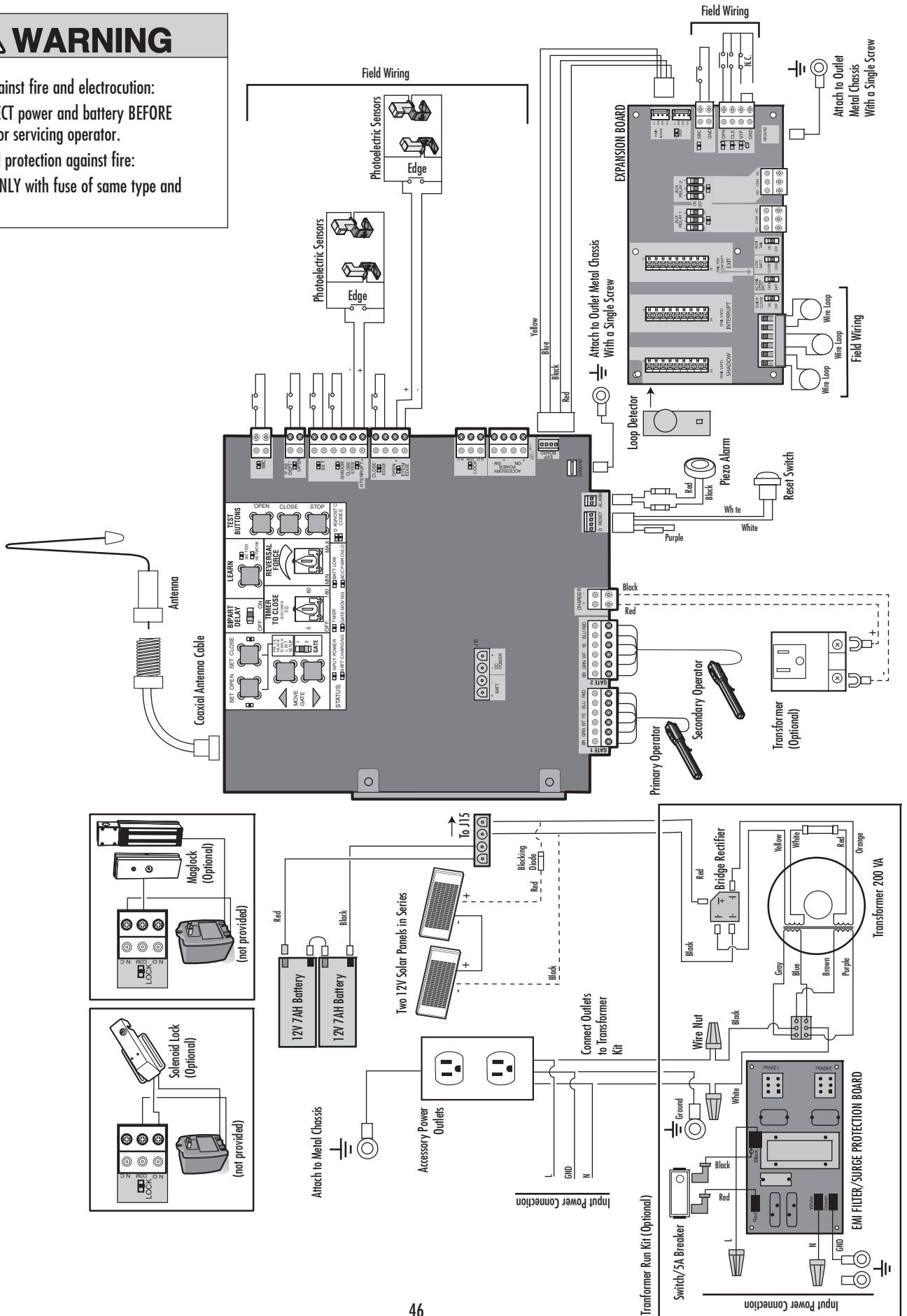
### ⚠ WARNING

To protect against fire and electrocution:

- DISCONNECT power and battery BEFORE installing or servicing operator.

For continued protection against fire:

- Replace ONLY with fuse of same type and rating.



### LARGE METAL CONTROL BOX (XLM)

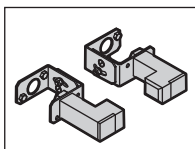


- Replace **ONLY** with fuse of same type and rating.



# ACCESSORIES

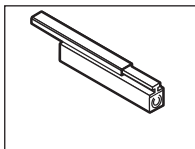
## ENTRAPMENT PROTECTION DEVICES



### PHOTOELECTRIC SENSORS (NON-CONTACT)

The photoelectric sensors are designed to detect an obstacle in the path of the electronic beam and stop the operator. Includes mounting brackets.

Models CPS-UN4 (through beam, LiftMaster low power accessory), AOMRON E3K-R10K4-NR (retro-reflective), RETROAB 60-2728 (retro-reflective),



### SENSING EDGE (2-WIRE, NON-MONITORED, CONTACT)

Sensing edges can detect an obstacle upon contact and stop the operator.

Models G65MG0204, G65MG0205, G65MGR205, and G65MGS205

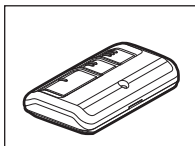
### SENSING EDGE CHANNEL

Mounting channel for all MG020 type edges.

Model G65ME120C5

## REMOTE CONTROLS

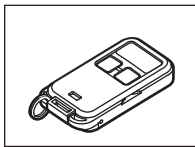
Chamberlain offers a variety of LiftMaster remote controls to satisfy your application needs. Single-button to 4-button, visor or key chain. The following remote controls are compatible with operators manufactured by Chamberlain after 1993. Contact your authorized LiftMaster dealer for additional details and options.



### 3-BUTTON REMOTE CONTROL

The 3-button remote control can be programmed to control the operator. Includes visor clip.

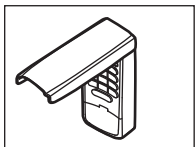
Model 893MAX



### 3-BUTTON MINI-REMOTE CONTROL

The 3-button remote control can be programmed to control the operator. Includes key ring and fastening strip.

Model 890MAX



### KEYLESS ENTRY

Enables homeowner to operate gate operator from outside by entering a 4-digit code on a specially designed keypad.

Model 877MAX

## MISCELLANEOUS



### REMOTE ANTENNA EXTENSION KIT

The remote antenna extension kit allows the antenna to be remotely installed.

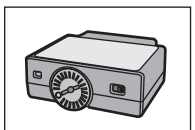
Model 86LM



### WIRELESS ACCESS CONTROL RECEIVER

Access control receiver for up to 450 remote controls.

Model STAR450-315

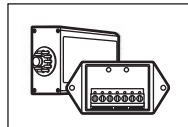


### PLUG-IN LOOP DETECTOR

Low power. Conveniently plugs into existing control board.

Model LOOPDETLTM

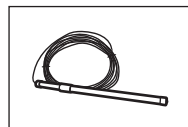
## MISCELLANEOUS



### LOOP DETECTOR

Low power loop detectors mounted and wired separately inside control box. LiftMaster low power accessory.

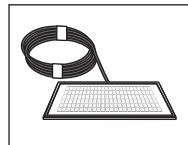
Model LD7LP



### VEHICLE SENSING PROBE

The vehicle sensing probe is buried in the ground and can detect a car as it approaches and will then open the gate.

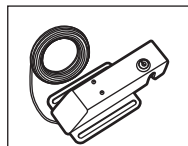
Model CP3



### SOLAR PANEL KIT - 10 WATT

This kit is to replace or add a solar panel to the operator application. Up to four solar panels can be connected to the operator. Requires a 33AH battery harness (see below).

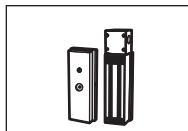
Model SOLPNL10W12V (requires 2 minimum)



### SOLENOID GATE LOCK

The automatic gate lock is a solenoid-driven lock that automatically unlocks when the gate is open and locks when the gate is closed. Can be mounted onto a gate or post. Can be released in case of emergency.

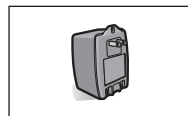
Model GC824-12 (12/24 Vac/dc)



### MAGNETIC GATE LOCK

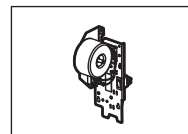
Outdoor magnetic lock, transformer, junction box, mounting plate and hardware. Not for use with Solar Applications. Must be powered separately.

Model MG1300 (12/24 Vdc)



### TRANSFORMER

Model APOW3



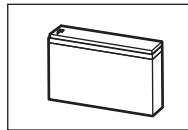
### TOROIDAL TRANSFORMER KIT (OPTIONAL)

Model LA500HDTKITXLM (for Large Metal Control Box)

This toroidal transformer kit is available for operators with firmware versions 5.1 and higher ONLY. To verify the firmware version refer to page 32.

## BATTERIES

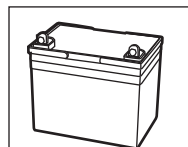
Gate access system batteries replace or upgrade the gate operator batteries. Two identical 12 Vdc batteries are required for each gate operator. Do not mix 7AH and 33AH batteries within a gate operator.



### 7AH BATTERIES

Standard 7 AMP-Hour Battery, 12 Vdc, to replace original batteries provided with operator. Reuse existing harnesses.

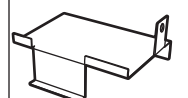
Model 29-NP712



### 33AH BATTERIES

Upgrade 33 AMP-Hour Battery, 12 Vdc. Ideal for solar applications and extended battery backup. For use with Large Metal Control Box ONLY.

Model A12330SGLPK



### BATTERY TRAY

Required for 33AH applications.

Model K10-36183



### SOLAR BATTERY HARNESS

Required for 33AH applications.

Model LA500SLRHARN



# WARRANTY

## LIFTMASTER 2 YEAR LIMITED WARRANTY

The Chamberlain Group, Inc. ("Seller") warrants to the first purchaser of this product, for the structure in which this product is originally installed, that it is free from defect in materials and/or workmanship for a period of 2 years from the date of purchase [and that the LA500™ and LA500CONT™ are free from defect in materials and/or workmanship for a period of 2 years from the date of purchase]. The proper operation of this product is dependent on your compliance with the instructions regarding installation, operation, maintenance and testing. Failure to comply strictly with those instructions will void this limited warranty in its entirety.

If, during the limited warranty period, this product appears to contain a defect covered by this limited warranty, call **1-800-528-2806**, toll free, before dismantling this product. Then send this product, pre-paid and insured, to our service center for warranty repair. You will be advised of shipping instructions when you call. Please include a brief description of the problem and a dated proof-of-purchase receipt with any product returned for warranty repair. Products returned to Seller for warranty repair, which upon receipt by Seller are confirmed to be defective and covered by this limited warranty, will be repaired or replaced (at Seller's sole option) at no cost to you and returned pre-paid. Defective parts will be repaired or replaced with new or factory-rebuilt parts at Seller's sole option.

**ALL IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE 2 YEAR LIMITED WARRANTY PERIOD SET FORTH ABOVE [EXCEPT THE IMPLIED WARRANTIES WITH RESPECT TO THE LA500™ AND LA500CONT™, WHICH ARE LIMITED IN DURATION TO THE 2 YEAR LIMITED WARRANTY PERIOD FOR THE LA500™ AND LA500CONT™], AND NO IMPLIED WARRANTIES WILL EXIST OR APPLY AFTER SUCH PERIOD. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. THIS LIMITED WARRANTY DOES NOT COVER NON-DEFECT DAMAGE, DAMAGE CAUSED BY IMPROPER INSTALLATION, OPERATION OR CARE (INCLUDING, BUT NOT LIMITED TO ABUSE, MISUSE, FAILURE TO PROVIDE REASONABLE AND NECESSARY MAINTENANCE, UNAUTHORIZED REPAIRS OR ANY ALTERATIONS TO THIS PRODUCT), LABOR CHARGES FOR REINSTALLING A REPAIRED OR REPLACED UNIT, OR REPLACEMENT OF BATTERIES.**

**THIS LIMITED WARRANTY DOES NOT COVER ANY PROBLEMS WITH, OR RELATING TO, THE GATE OR GATE HARDWARE, INCLUDING BUT NOT LIMITED TO THE GATE SPRINGS, GATE ROLLERS, GATE ALIGNMENT OR HINGES. THIS LIMITED WARRANTY ALSO DOES NOT COVER ANY PROBLEMS CAUSED BY INTERFERENCE. ANY SERVICE CALL THAT DETERMINES THE PROBLEM HAS BEEN CAUSED BY ANY OF THESE ITEMS COULD RESULT IN A FEE TO YOU.**

**UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES ARISING IN CONNECTION WITH USE, OR INABILITY TO USE, THIS PRODUCT. IN NO EVENT SHALL SELLER'S LIABILITY FOR BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE OR STRICT LIABILITY EXCEED THE COST OF THE PRODUCT COVERED HEREBY. NO PERSON IS AUTHORIZED TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF THIS PRODUCT.**

Some states do not allow the exclusion or limitation of consequential, incidental or special damages, so the above limitation or exclusion may not apply to you. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**845 Larch Avenue  
Elmhurst, Illinois 60126-1196**